MATH PRACTICE WORKSHEETS

Table of Contents

GEOMETRY (10)

- 1: Lines, rays, segments & angles
- 2: Lines, rays, segments & angles
- 3: Parallel lines & transversals
- 4: Triangles
- 5: Triangles
- 6: Quadrilaterals
- 7: Quadrilaterals
- 8: Summary
- 9: Summary
- 10: Summary

CONSTRUCTION GEOMETRY (12)

- 1: Drawing segments & angles
- 2: Drawing circles & sectors
- 3: Drawing circles & sectors
- 4: Constructing bisectors
- 5: Drawing triangles
- 6: Drawing triangles
- 7: Drawing quadrilaterals
- 8: Drawing polygons
- 9: Drawing polygons
- 10: Summary
- 11: Summary
- 12: Summary

ALGEBRA (6)

- 1: Equations
- 2: Equations
- 3: Equations
- 4: Equations
- 5: Polynomials
- 6: Polynomials

TRIGONOMETRY (5)

- 1: Trigonometry
- 2: Trigonometry
- 3: Trigonometry
- 4: Trigonometry
- 5: Trigonometry

MEASUREMENT (4)

- 1: Measurement
- 2: Measurement
- 3: Measurement
- 4: Measurement

PERIMETER, AREA & VOLUME (3)

- 1: Perimeter, area & volume
- 2: Perimeter, area & volume
- 3: Perimeter, area & volume

RATIO & PROPORTION (4)

- 1: Ratio & proportion
- 2: Ratio & proportion
- 3: Ratio & proportion
- 4: Ratio & proportion

PERCENT (4)

- 1: Percent
- 2: Percent
- 3: Percent
- 4: Percent

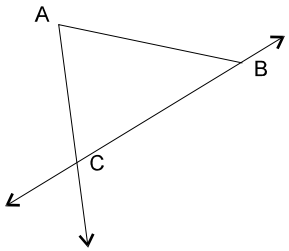
GRAPHING (4)

- 1: Graphing
- 2: Graphing
- 3: Graphing
- 4: Graphing

Geometry

GEOMETRY 1: LINES, RAYS, SEGMENTS & ANGLES

1. From the drawing:



a. name three different line segments

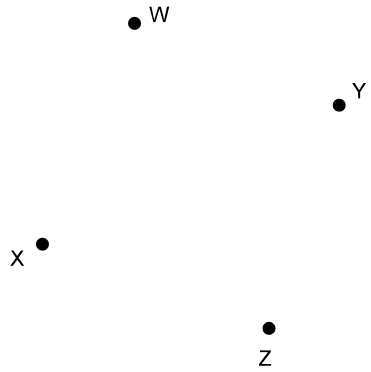
b. name the line

c. name three different rays

d. name the point where $\overline{AC}$ intersects $\overline{BC}$

e. is $\overline{BC} || \overline{AC}$? Why?

2. Using the points W, X, Y and Z, draw the following:



a. $\overline{WY}$

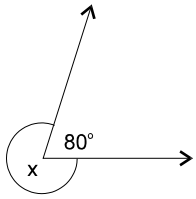
b. $\overleftrightarrow{XY}$

c. $\overrightarrow{WX}$

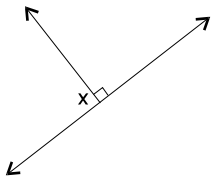
d. line m which contains Z so that m $||$ $\overleftrightarrow{XY}$

3. Calculate the measure of angle x in each drawing below. Do not use a protractor.

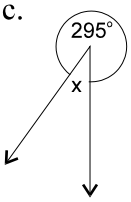
a.



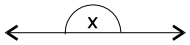
b.



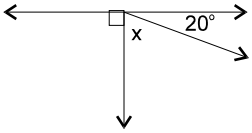
c.



d.

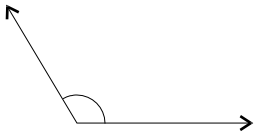


e.

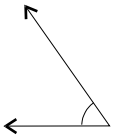


4. With a protractor, measure the angle indicated by the curve.

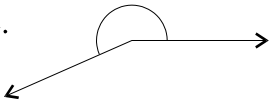
a.



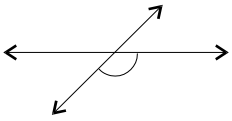
b.



c.



d.



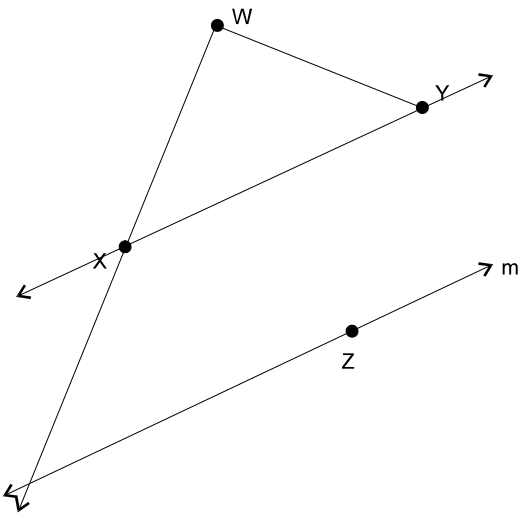
ANSWER KEY

1. a. $\overline{AB}$, $\overline{AC}$, $\overline{BC}$

b. $\overleftrightarrow{BC}$ c. $\overrightarrow{AC}$ $\overrightarrow{BC}$ $\overrightarrow{CB}$

d. C e. No. The segments intersect at point A

2.



3. a. 280° b. 90° c. 65° d. 180° e. 70°

4. a. 120° b. 55° c. 202° d. 135°

Source: Government of BC used with permission.

GEOMETRY 2: LINES, RAYS, SEGMENTS & ANGLES

1. Use a protractor to draw the following angles. Label all parts.

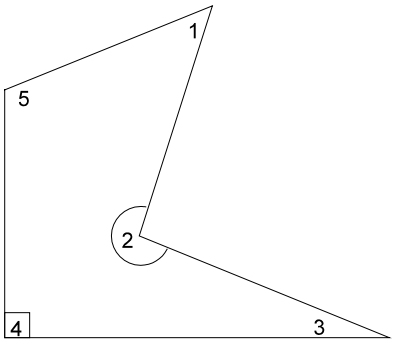
a. $\angle ABC = 40°$

b. $\angle DEF = 155°$

c. $\angle GHI = 270°$

d. $\angle JKL = 350°$

2. Classify the angles in the figure below as acute, right, obtuse, straight or reflex.



$\angle 1$ is

$\angle 2$ is

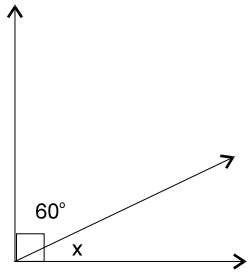
$\angle 3$ is

$\angle 4$ is

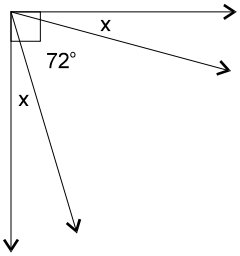
$\angle 5$ is

3. Find the angle marked x, y or z in each of the following. Do not use a protractor.

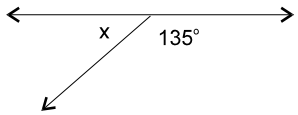
a.



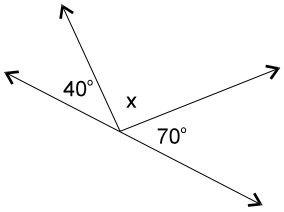
b.



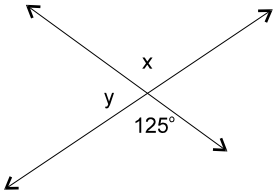
c.



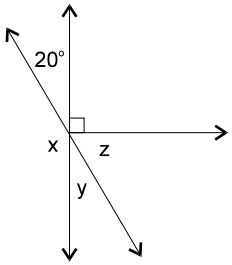
d.



e.



f.



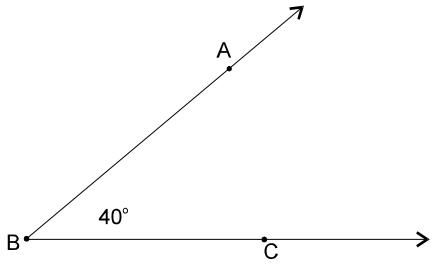
4. a. ∠A and ∠B are vertically opposite and ∠B = 132°. ∠A = ____

b. ∠C and ∠D are complimentary and ∠C = 89°. ∠D = _____

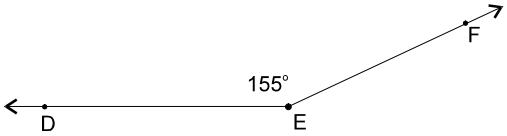
c. ∠E and ∠F are congruent and supplementary. ∠E = _____ ∠F = _____

ANSWER KEY

1. a.

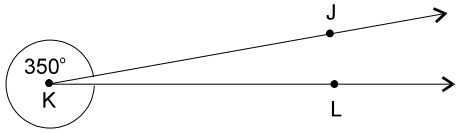


b.



c.

d.



2. ∠1 is acute ∠2 is reflex ∠3 is acute ∠4 is right ∠5 is obtuse

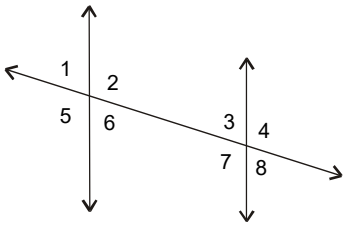
3. a. x = 30° b. x = 9° c. x = 45° d. x = 70° e. x = 125°, y = 55°
   f. x = 160°, y = 20°, z = 70°

4. a. ∠A = 132° b. ∠D = 1° c. ∠E = 90° and ∠F = 90°

Source: Government of BC used with permission.

GEOMETRY 3: PARALLEL LINES & TRANSVERSALS

1. From the diagram, list all the pairs of:

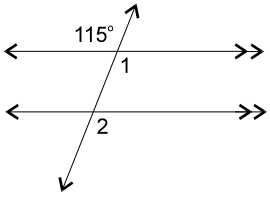


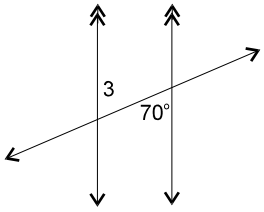
   a. alternate interior angles

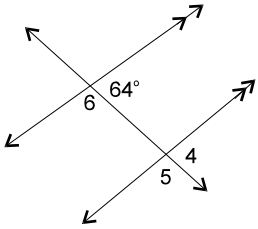
   b. interior angles on the same side of the transversal

   c. corresponding angles

2. Determine the indicated angles in each drawing below. State the reasons for each answer.







∠1 =

∠2 =

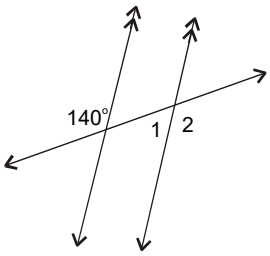
∠3 =

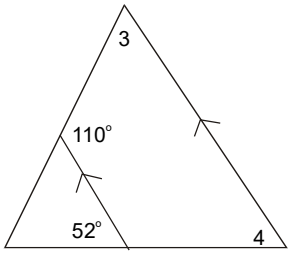
∠4 =

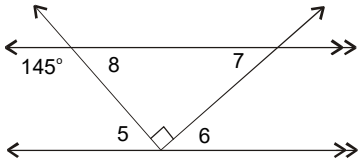
∠5 =

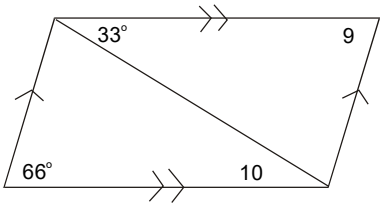
∠6 =

3. Determine the indicated angles in each of the drawings below.









∠1 =

∠2 =

∠3 =

∠4 =

∠5 =

∠6 =

∠7 =

∠8 =

∠9 =

∠10 =

ANSWER KEY

1. a. ∠2 and ∠7, ∠3 and ∠6 b. ∠2 and ∠3, ∠6 and ∠7

   c. ∠1 and ∠3, ∠2 and ∠4, ∠5 and ∠7, ∠6 and ∠8

2. ∠1 = 115° vertically opposite

   ∠2 = 115° corresponding to ∠1

   ∠3 = 70° alt int ∠ to 70°

   ∠4 = 64° corr ∠ to 64°

   ∠5 = 116° supp ∠ to ∠4

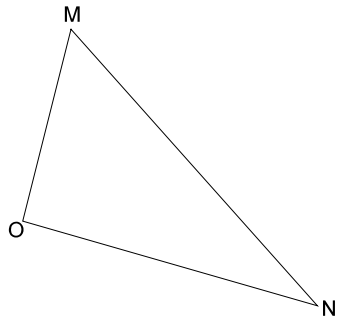
   ∠6 = 116° corr ∠ to ∠5 or supp ∠ to 64°

3. ∠1 = 40° ∠2 = 140° ∠3 = 70° ∠4 = 52° ∠5 = 35°

   ∠6 = 55° ∠7 = 55° ∠8 = 35° ∠9 = 66° ∠10 = 33°

GEOMETRY 4: TRIANGLES

1. In ΔMON name:



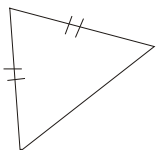
a. the angle opposite $\overline{MO}$

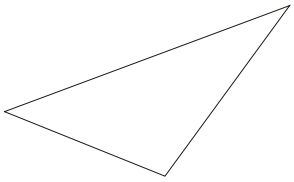
b. the side opposite $\angle MNO$

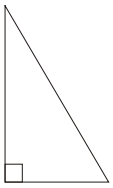
c. the side opposite $\angle O$

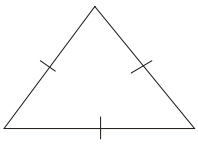
d. the angle opposite $\overline{ON}$

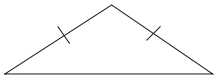
2. Classify the following triangles as either acute, right or obtuse triangles, as well as scalene, isosceles or equilateral triangles.

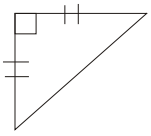
a. 

b. 

c. 

d. 

e. 

f. 

3. Fill in the blanks with the correct answer.

a. An equilateral triangle has _____ congruent sides and three _____ angles each measuring _____.

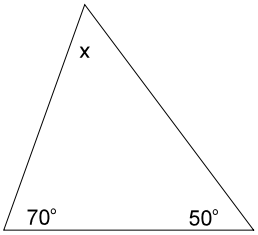
b. An isosceles triangle has _____ congruent sides. The angles opposite these congruent sides are _____.

c. The sum of the interior angles of any triangle is always _____ .

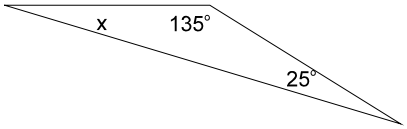
d. If a triangle has two congruent angles, then the sides opposite the congruent angles are _____ _____ .

4. Determine the measure of angle x in each of the following diagrams.

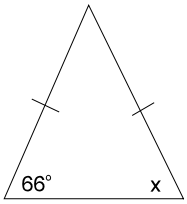
a.



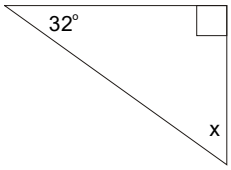
b.



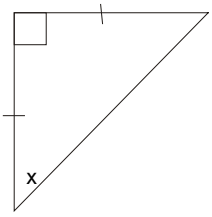
c.



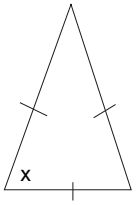
d.



e.



f.



ANSWER KEY

1. a. $\angle$N or $\angle$MNO b. $\overline{MO}$ c. $\overline{MN}$ d. $\angle$M

2. a. acute and isosceles b. obtuse and scalene c. right and scalene
   d. acute and equilateral e. obtuse and isosceles f. right and isosceles

3. a. three congruent 60° b. two congruent c. 180° d. congruent

4. a. 60° b. 20° c. 66° d. 58° e. 45° f. 60°

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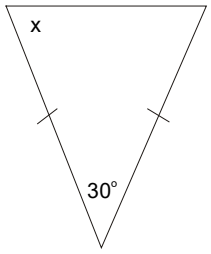
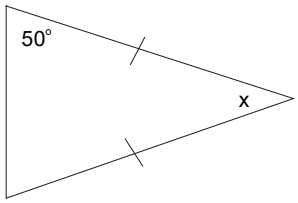
GEOMETRY 5: TRIANGLES

1. Determine the measure of angle x in each of the following diagrams.
(a-f are in Mathsheet: Geometry 4.)

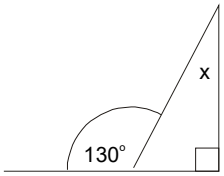
g.



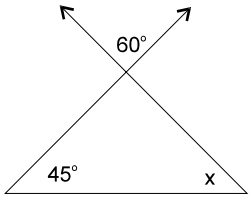
h.



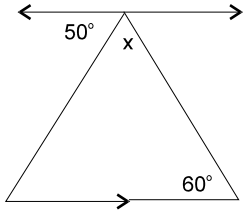
i.



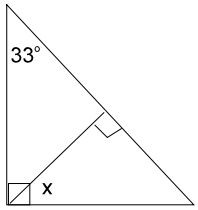
j.



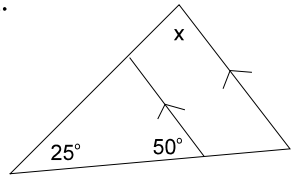
k.



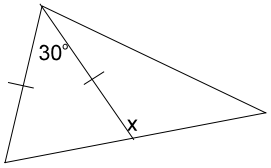
l.



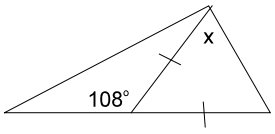
m.



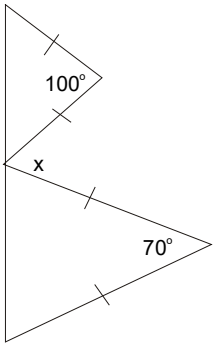
n.



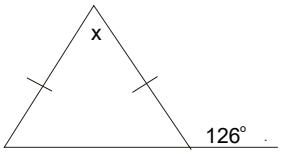
o.



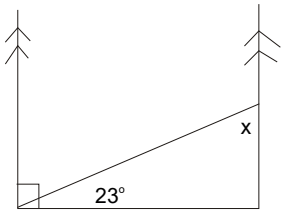
p.



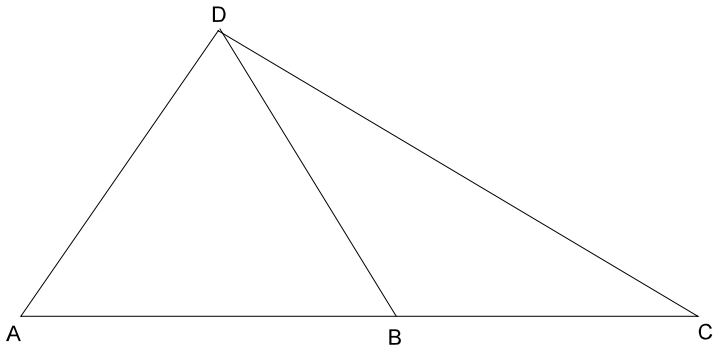
q.



r.



2. In the drawing below, $\overline{AD} = \overline{BD}$, $\angle A = 62°$ and $\angle C = 34°$



Find the following and state reasons for your answers.

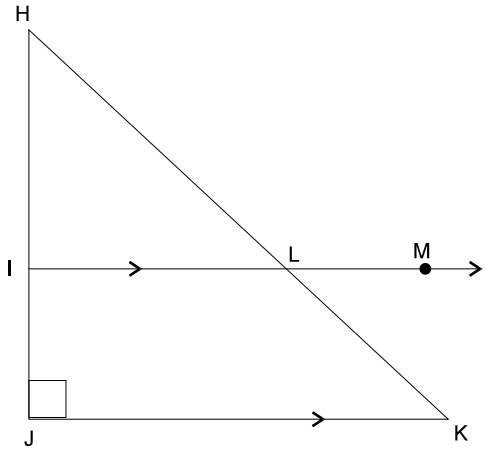
$\angle ABD =$

$\angle CBD =$

$\angle ADB =$

$\angle BDC =$

3. In the drawing below $\angle J = 90°$, $\overrightarrow{IL} \parallel \overline{JK}$ and $\angle HLM = 130°$. Find the following and state reasons for your answers.



$\angle ILK =$

$\angle K =$

$\angle H =$

$\angle HIL =$

ANSWER KEY

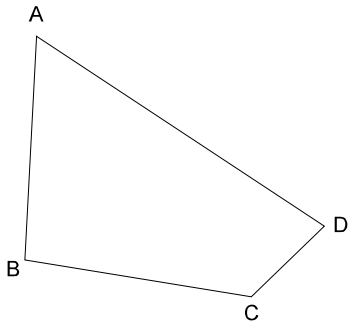
1. g. 75° h. 80° i. 40° j. 75° k. 70° l. 33°
   m. 105° n. 105° o. 54° p. 85° q. 72° r. 67°

2. ∠ABD = 62° angles opposite congruent sides of isosceles triangles are congruent
   ∠CBD = 118° supplementary to 62°
   ∠ADB = 56° angle sum of ΔABD is 180°
   ∠BDC = 28° angle sum of ΔBCD is 180°

3. ∠ILK = 130° vertically opposite angle to 130°
   ∠K = 50° angles on the same side of the transversal are supplementary
   ∠H = 40° angle sum of a triangle is 180°
   ∠HIL = 90° corresponding angle to ∠J

GEOMETRY 6: QUADRILATERALS

1. Given the quadrilateral ABCD:



   a. name the angle opposite $\angle D$

   b. name the side opposite $\overline{BC}$

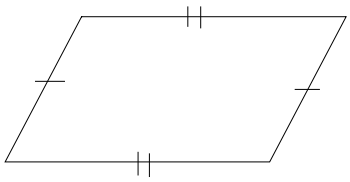
   c. name two angles consecutive to $\angle D$

   d. name two sides adjacent to $\overline{AB}$

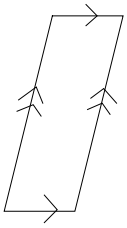
   e. $\angle A + \angle B + \angle C + \angle D =$

2. Identify the following as trapezoids (T), parallelograms (P), rectangles (Rec), rhombuses (Rh) or squares (S). Recall that many of these figures have more than one name.

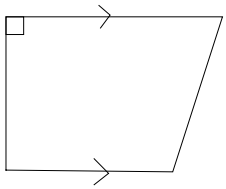
a.



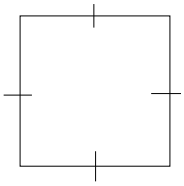
b.



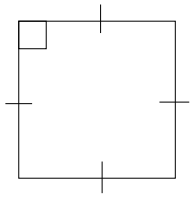
c.



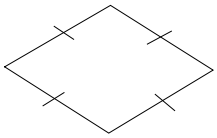
d.



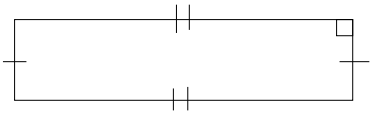
e.



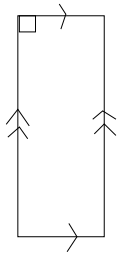
f.



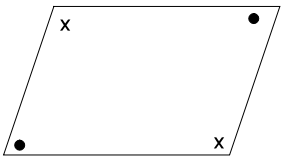
g.



h.

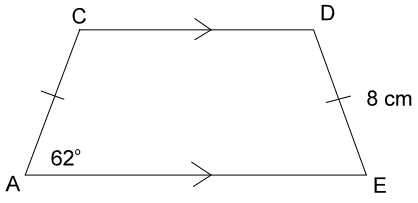


i.



3. In each of the following, identify the type of quadrilateral shown. Also find the indicated angles and sides. Do not use a protractor.

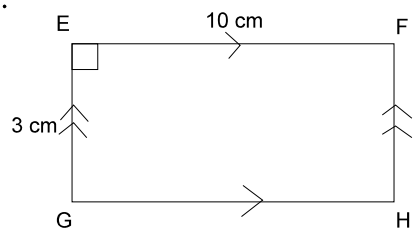
a.



ABCD is a _____ .

∠C = _____ $\overline{AC}$ = _____

b.



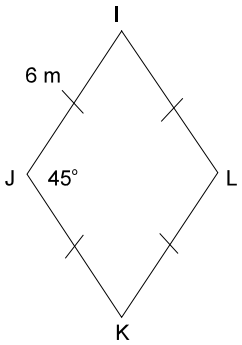
EFGH is a _____ .

∠G = _____ ∠H = _____

∠F = _____

$\overline{GH}$ = _____ $\overline{FH}$ = _____

c.



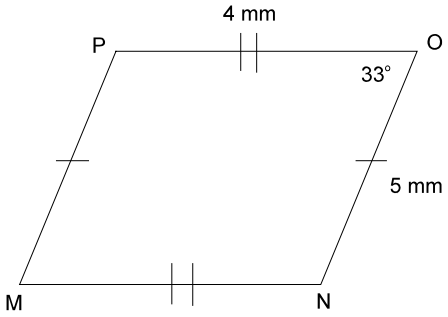
IJKL is a _____

∠I = _____ ∠L = _____

∠K = _____

$\overline{IL}$ = _____ $\overline{KL}$ _____

d.

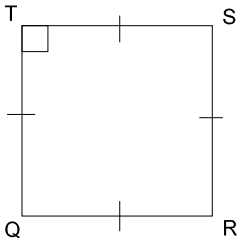


MNOP is a _____

∠M = _____ ∠P = _____

$\overline{PM}$ = _____ $\overline{MN}$ =

e.



QRST is a _____ .

The four interior angles each measure _____ .

Each side measures _____ .

ANSWER KEY

1. a. $\angle B$ b. $\overline{AD}$ c. $\angle A$ and $\angle C$ d. $\overline{AD}$ and $\overline{BC}$ e. 360°

2. a. P b. P c. T d. Rh, P e. S, Rh, P f. Rh, P
   g. Rec, P h. Rec, P i. P

3. a. trapezoid 118°, 8 cm
   b. rectangle 90°, 90°, 90°, 10 cm, 3 cm
   c. rhombus 35°, 145°, 35°, 6 m, 6m
   d. parallelogram 33°, 247°, 5 mm, 4 mm
   e. square 90°, 16 km

GEOMETRY 7: QUADRILATERALS

1. Complete the following statements:

   a. The sum of the interior angles of any quadrilateral is _____ .

   b. The opposite sides of any parallelogram are both _____ and _____ .

   c. Each interior angle of a rectangle measures _____ .

   d. The four sides of a square are _____ and the opposite sides are _____ .

   e. The diagonals of a _____ are always congruent, so are the diagonals of a _____ .

   f. The diagonals of a _____ always intersect at right angles, so do the diagonals of a _____ .

   g. If one angle of a parallelogram is 90°, then it is also a _____ .

   h. If all the sides of a parallelogram are congruent, then it is also a _____ .

   i. The diagonals of a parallelogram always _____ each other.

2. From the drawings below, determine the indicated measurements.

   ABCD is a _____ .

   ∠AEB = _____

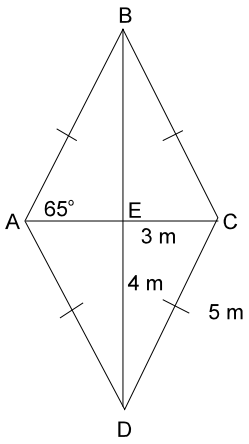
   ∠ABD = _____

   ∠DAE = _____

   $\overline{AE}$ = _____

   $\overline{BE}$ = _____

   $\overline{AD}$ = _____



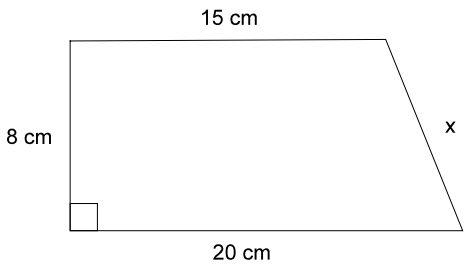
3. One side of a square is 6 m. Find the length of its diagonal. Hint: make a sketch of the square and its diagonal and then use Pythagorean Theorem.

4. The diagonal and one side of a rectangle are 14 cm and 9 cm respectively. Find the length of the other side of the rectangle.

5. A rectangle measures 13 m by 15 m. Find the length of its diagonal.

6. A rhombus has diagonals of length 42 cm and 80 cm. Find the length of the sides of the rhombus.

7. Find side x in the trapezoid.



ANSWER KEY

1. a. 360° b. congruent and parallel c. 90° d. congruent, parallel
   e. rectangle, square (in any order) f. square, rhombus
   g. rectangle h. rhombus i. bisect

2. rhombus 90°, 25°, 65°, 3 m, 4 m, 5 m

3. 8.5 m

4. 10.7 cm

5. 19.8 m

6. 45.2 cm

7. 9.4 cm

GEOMETRY 8: SUMMARY

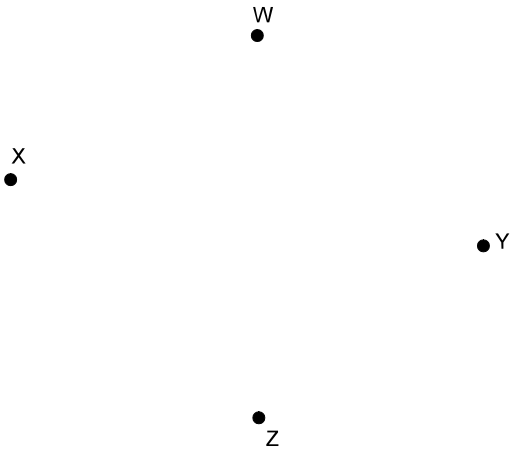
1. Using the points W, X Y and Z, draw the following:

   a. line XY

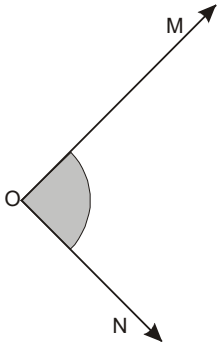
   b. ray YW

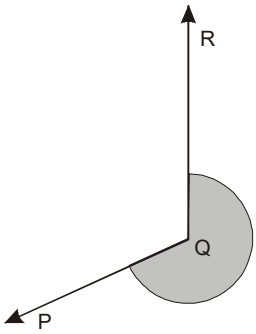
   c. line segment WZ

   d. a line that contains Z and is parallel to line XY

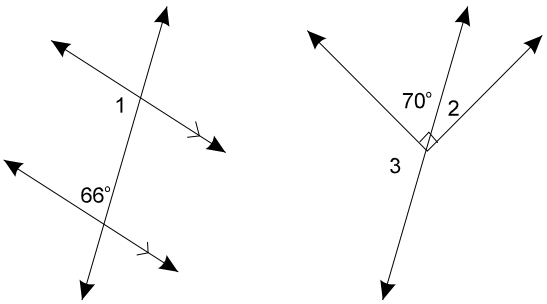


2. Use a protractor to measure angles MON and PQR.





3. Determine the measure of the indicated angle in each of the following. Do not use a protractor.

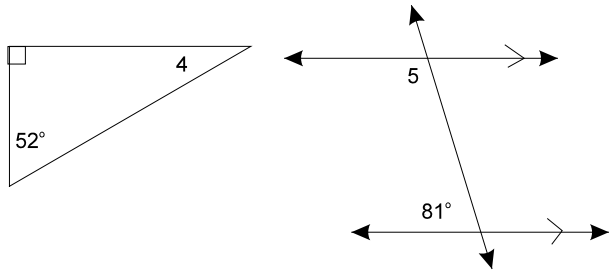


a. ∠1 _____

b. ∠2 _____

c. ∠3 _____

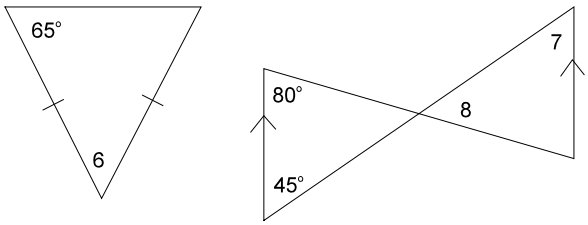
d. ∠4 _____



e. ∠5 _____

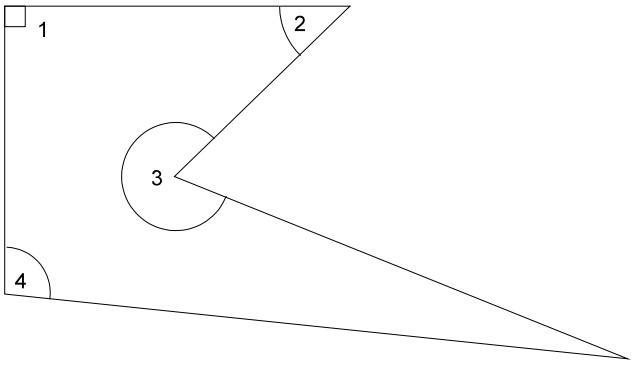
f. ∠6 _____

g. ∠7 _____



h. ∠8 _____

4. Name the type of angles indicated in the drawing.



a. ∠1 _____

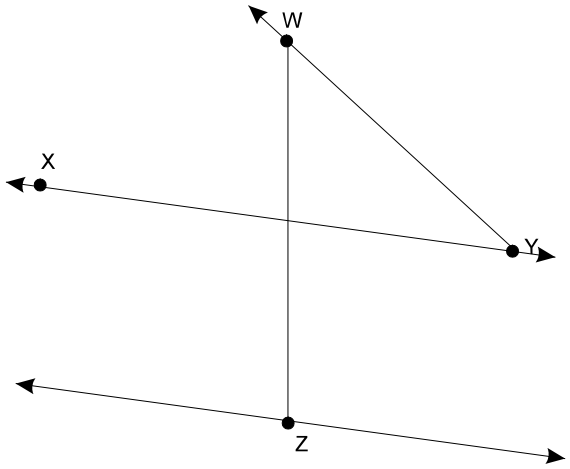
b. ∠2 _____

c. ∠3 _____

d. ∠4 _____

ANSWER KEY

1.



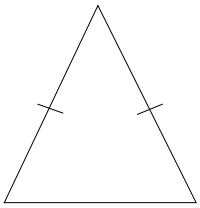
2. ∠MON = 90° ∠PQR = 245°

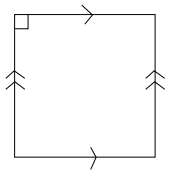
3. a. ∠1 = 114°
   b. ∠2 = 20°
   c. ∠3 = 110°
   d. ∠4 = 38°
   e. ∠5 = 99°
   f. ∠6 = 50°
   g. ∠7 = 45°
   h. ∠8 = 55°

4. a. ∠1 is right
   b. ∠2 is acute
   c. ∠3 is reflex
   d. ∠4 is obtuse

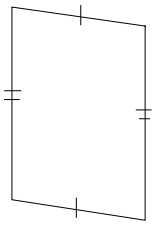
GEOMETRY 9: SUMMARY

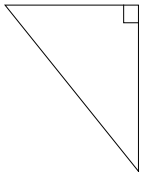
1. Name the type of triangle or quadrilateral shown below.

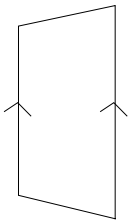
a. 

b. 

c. 

d. 

e. 

f. 

a. _____

b. _____

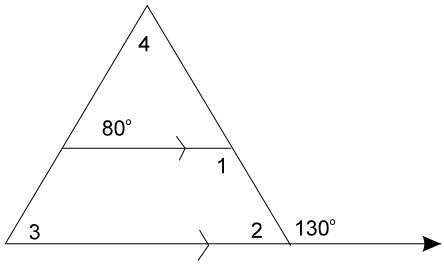
c. _____

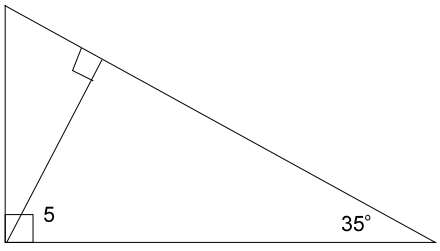
d. _____

e. _____

f. _____

2. In the drawings shown below, determine the measure of the indicated angles and give a reason for your answers. Do not use a protractor.





a. ∠1 _____

b. ∠2 _____

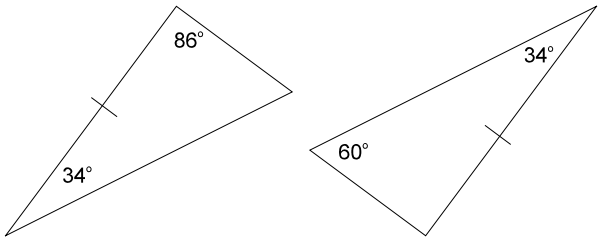
c. ∠3 _____

d. ∠4 _____

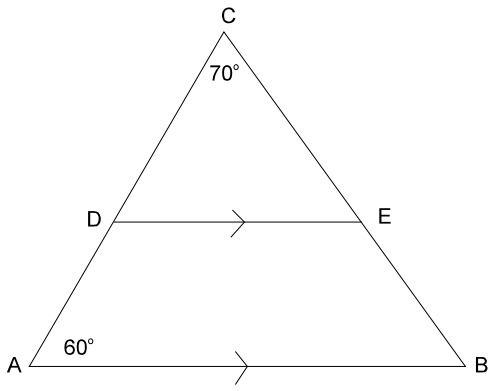
e. ∠5 _____

3. Draw a circle with a diameter of 7 cm.

4. Are the two triangles in the drawing congruent? If so, state the theorem that applies.



5. Are ΔCDE and ΔCAB similar? If so, why? If not, why not?

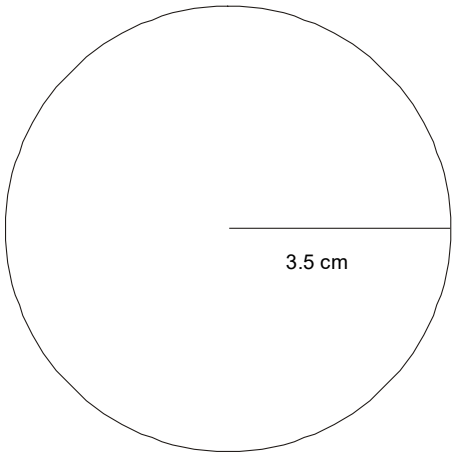


ANSWER KEY

1. a. equilateral or acute triangle
   b. parallelogram
   c. right or scalene triangle
   d. rhombus
   e. rectangle
   f. isosceles or acute triangle
   g. trapezoid

2. a. $\angle 1 = 55°$, definition of isosceles
   b. $\angle 2 = 70°$, sum of triangle = 180°
   c. $\angle 3 = 20°$, complementary
   d. $\angle 4 = 35°$, sum of triangle = 180° and definition of isosceles triangle

3.



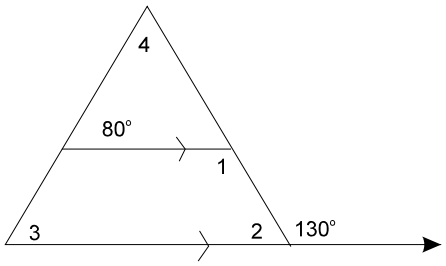
4. yes, SAS

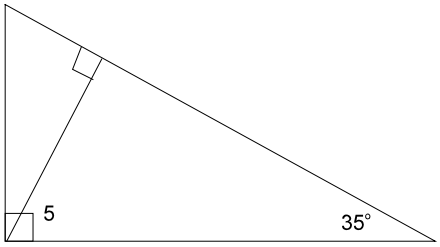
5. No, angles are not the same

Source: Government of BC used with permission.

GEOMETRY 10: SUMMARY

1. In the drawings shown below, determine the measure of the indicated angles and give a reason for your answers. Do not use a protractor.





a. ∠1 _____

b. ∠2 _____

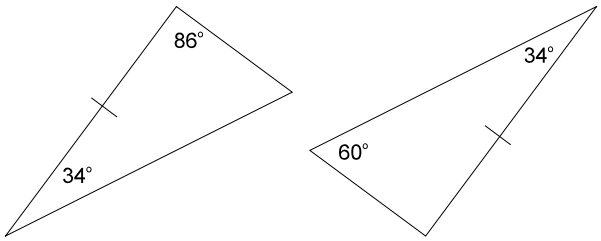
c. ∠3 _____

d. ∠4 _____

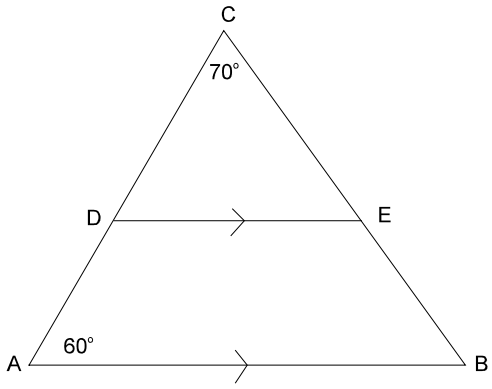
e. ∠5 _____

2. Draw a circle with a diameter of 8 cm.

3. Are the two triangles in the drawing congruent? If so, state the theorem that applies.



4. Are ΔCDE and ΔCAB similar? If so, why? If not, why not?



ANSWER KEY

1. a. $\angle 1 = 130°$, alt. int. angle to 130°

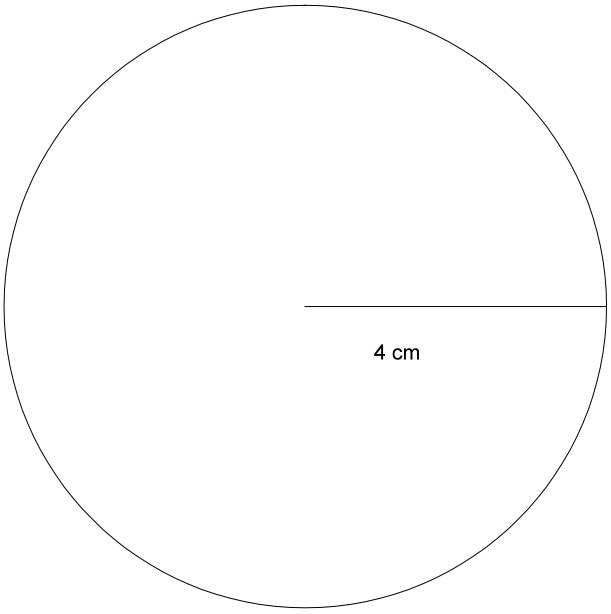
   b. $\angle 2 = 50°$, supplementary to 130°

   c. $\angle 3 = 80°$, corr. angle

   d. $\angle 4 = 50°$ sum of angles = 180°

   e. $\angle 5 = 55°$, complementary angle

2.



3. yes, ASA

4. yes, angles are equal

Source: Government of BC used with permission.

Construction Geometry

CONSTRUCTION GEOMETRY 1: DRAWING SEGMENTS & ANGLES

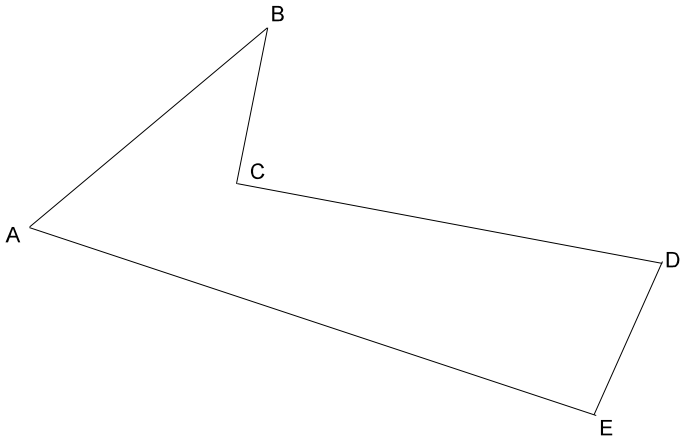
1. Measure the following to the nearest 0.1 cm.

$\overline{AB}$ = _____

$\overline{BC}$ = _____

$\overline{AE}$ = _____

$\overline{CD}$ = _____



2. Draw and label the following line segments.

$\overline{XY} = 6.5\text{ cm}$

$\overline{RS} = 0.4\text{ cm}$

$\overline{MS} = 15.3\text{ cm}$

3. With a protractor, measure the following angles.

∠PON = _____

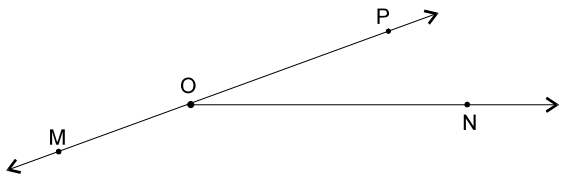
∠MON = _____

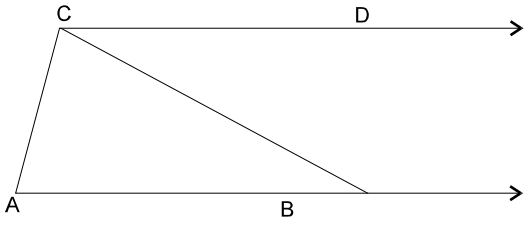
∠MOP = _____

∠BAC = _____

reflex ∠BAC = _

∠DCA = _____





4. Draw and label the following angles.

a. ∠LAB = 35°

b. ∠BIG = 6°

c. ∠COW = 145°

d. ∠FUN = 90°

e. ∠RAT = 180°

f. ∠DOG = 315°

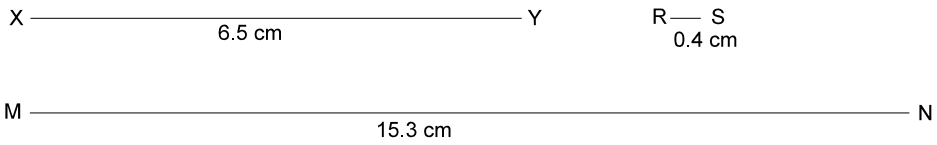
g. ∠PET = 205°

h. ∠JIM = 72°

ANSWER KEY

1. $\overline{AB} = 4$ cm, $\overline{BC} = 2.1$ cm, $\overline{AE} = 7.8$ cm, $\overline{CD} = 5.6$ cm

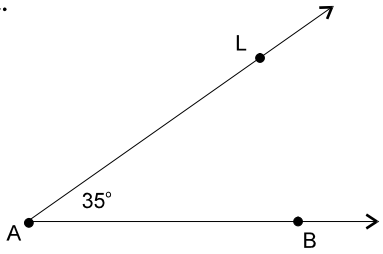
2.



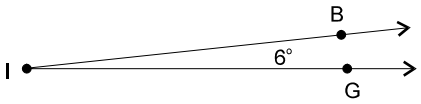
3. ∠PON = 20°, ∠MON = 160°, ∠MOP = 180°, ∠BAC = 75°

4.

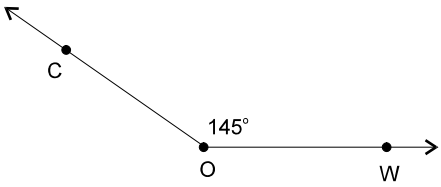
a.



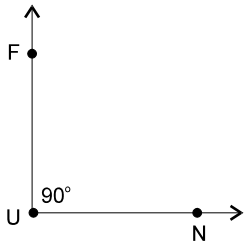
b.



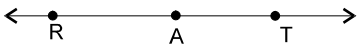
c.



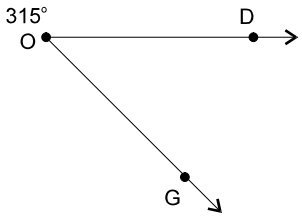
d



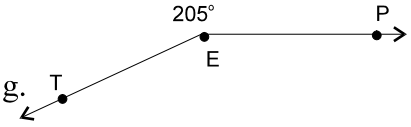
e.



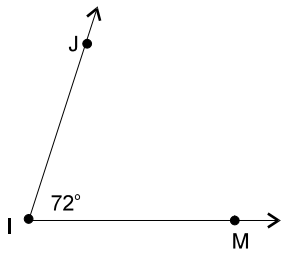
f.



g.



h.



Source: Government of BC used with permission.

CONSTRUCTION GEOMETRY 2: DRAWING CIRCLES & SECTORS

1. Draw and label the following circles.

   a. radius = 4.5 cm

   b. diameter = 6 cm

   c. radius = 1.8 cm

   d. diameter = 7.6 cm

2. Given the points A, B and C, construct the following.

a. a circle with centre A and radius $\overline{AC}$

b. a circle with centre B and radius $\overline{BA}$

c. a circle with centre A and radius $\overline{AB}$

B

A

C

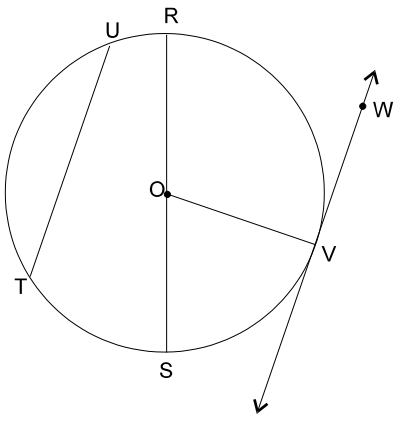
3. O is the centre of the circle.

a. name the diameter

b. name two chords

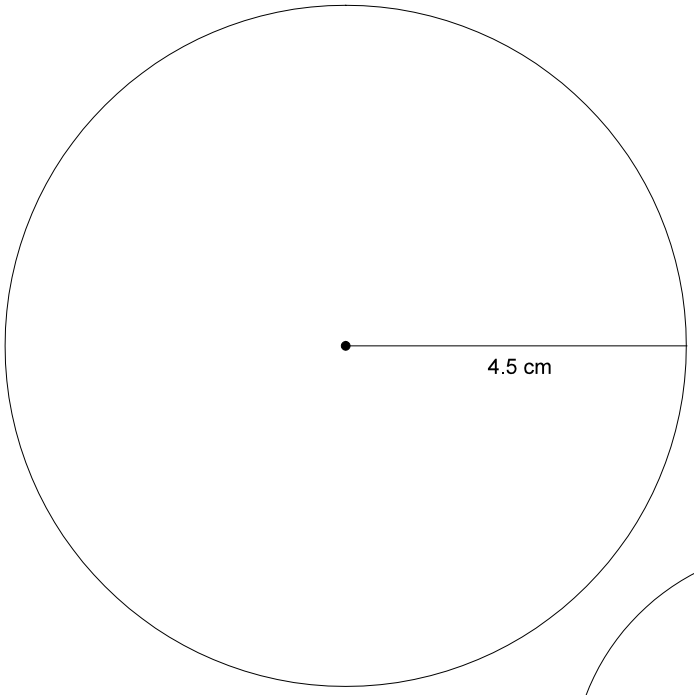
c. name the tangent line

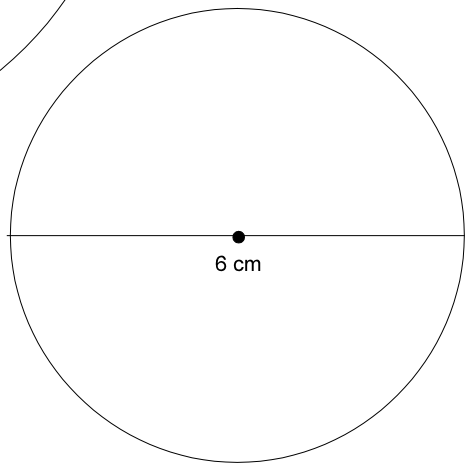
d. measure $\angle OVW$



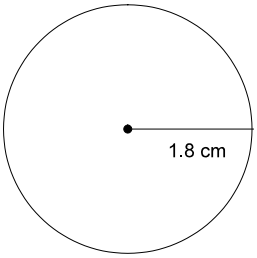
ANSWER KEY

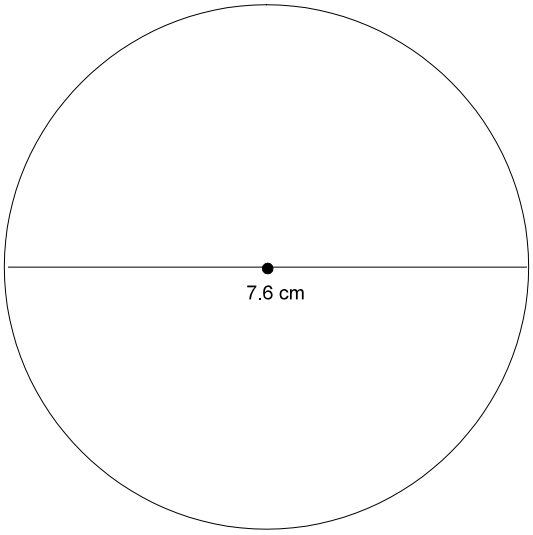
1. a and b



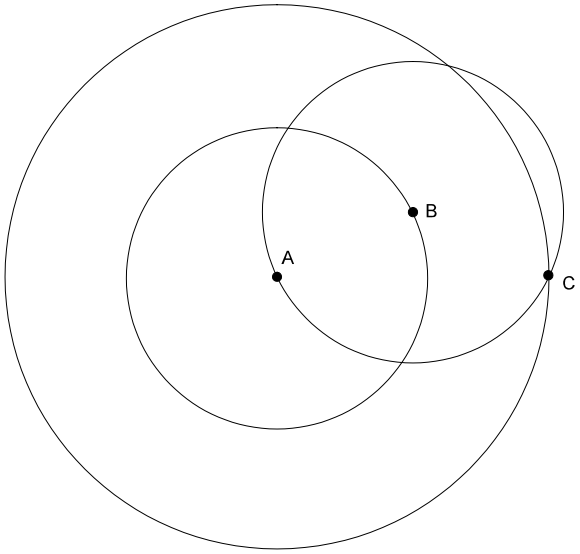


c and d





2.

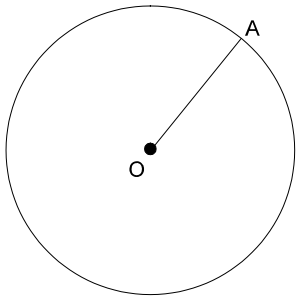


3. a. $\overline{RS}$ b. $\overline{OR}, \overline{OS}, \overline{OV}$ c. $\overline{RS}, \overline{TU}$ d. $\overleftrightarrow{WV}$ e. 90°

Source: Government of BC used with permission.

CONSTRUCTION GEOMETRY 3: DRAWING CIRCLES & SECTORS

1. Draw a tangent line, AB to the circle.



2. Draw a semi-circle with a radius of 3 cm.

3. Draw and label the following sectors.

a. radii = 4 cm, angle = 50°

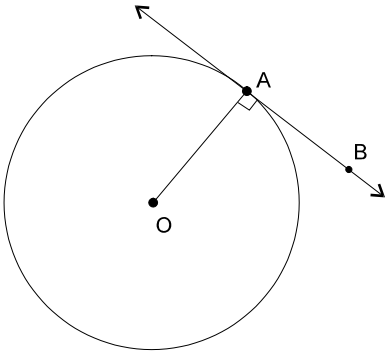
b. radii = 2.5 cm, angle = 90°

c. radii = 3.2 cm, angle = 150°

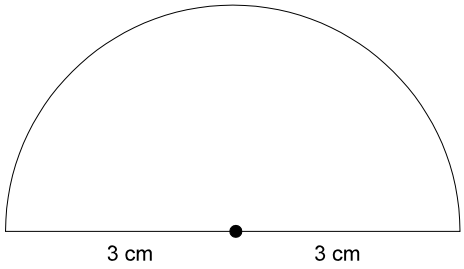
d. radii = 5 cm, angle = 300°

ANSWER KEY

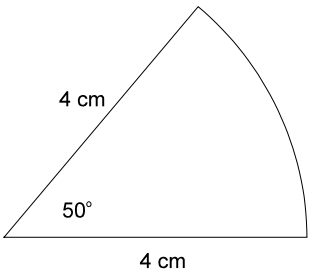
1.



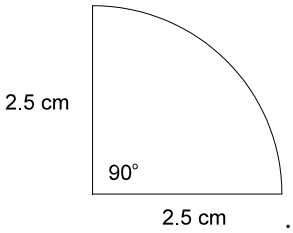
2.



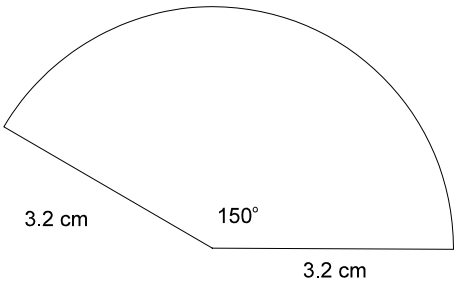
3. a.



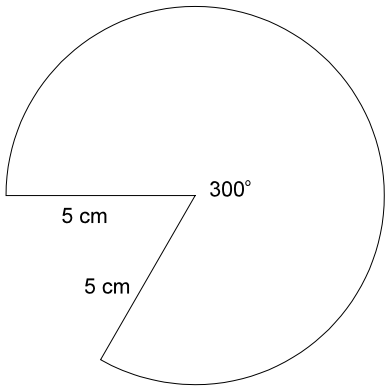
b.



c.



d.

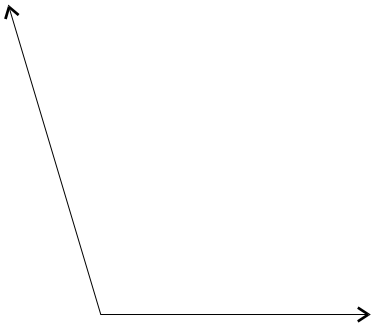


Source: Government of BC used with permission.

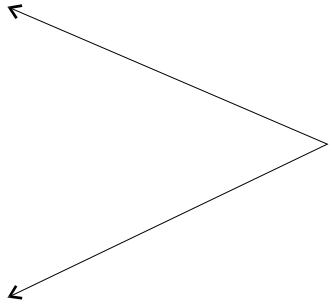
CONSTRUCTION GEOMETRY 4: CONSTRUCTING BISECTORS

1. Use only a compass and straightedge to bisect the following angles.

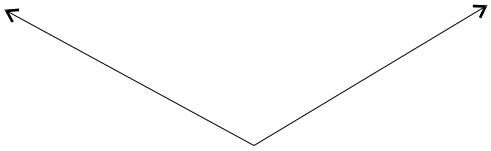
a.



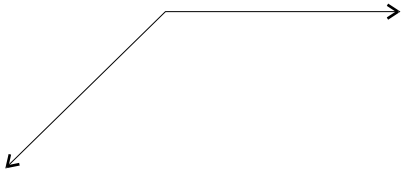
b.



c.

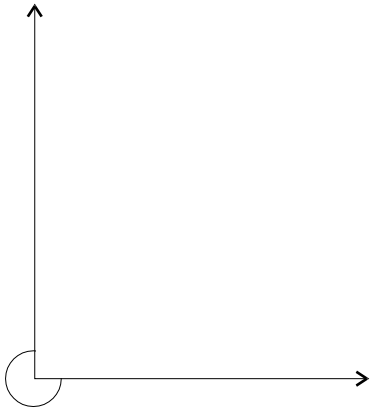


d.

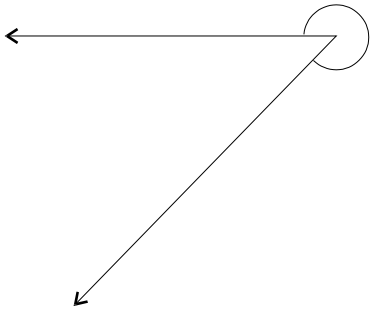


2. Bisect the reflex angles.

a.

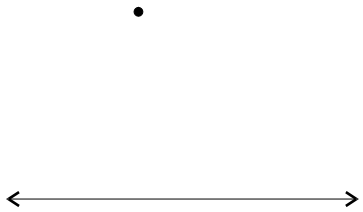


b.

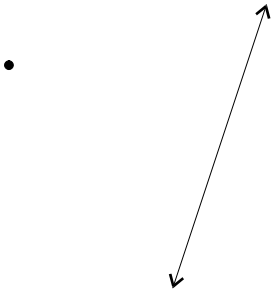


3. Construct a perpendicular line to the given line through the given point.

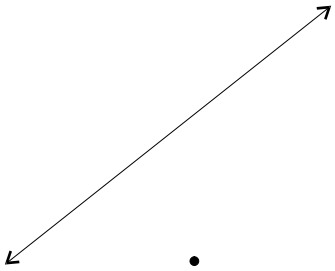
a.



b.

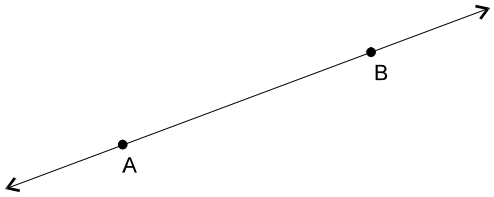


c.

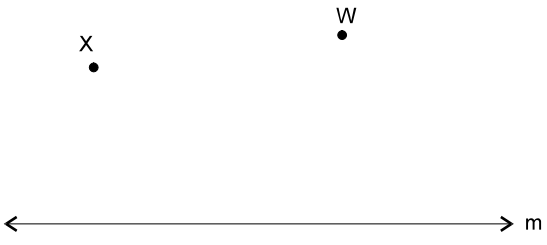


4. Construct the following

a. a line $\overleftrightarrow{AC}$ where $\overleftrightarrow{AC} \perp \overleftrightarrow{AB}$



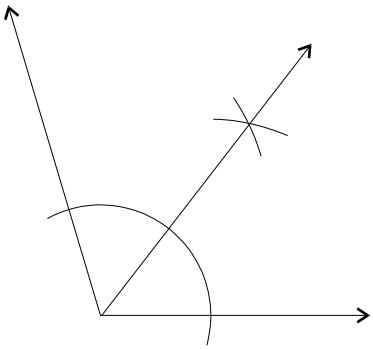
b. lines $\overline{XY}$ and $\overline{WZ}$
so that $\overleftrightarrow{XY} \perp m$ and $\overleftrightarrow{WZ} \perp m$



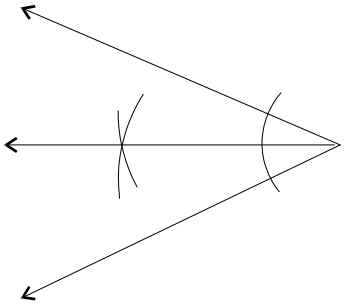
ANSWER KEY

1.

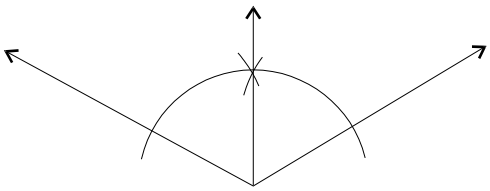
a.



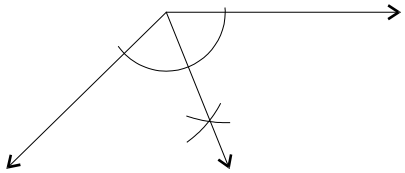
b.



c.

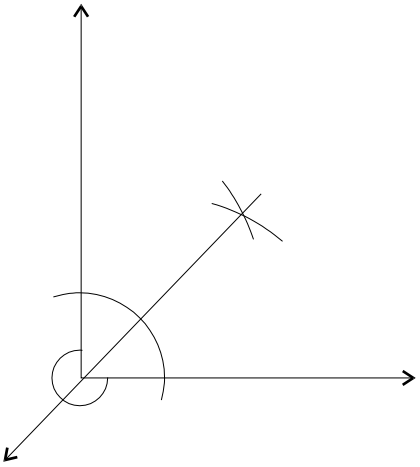


d.

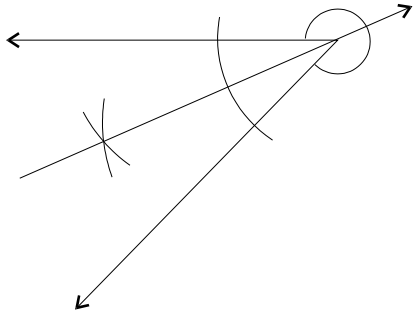


2.

a.

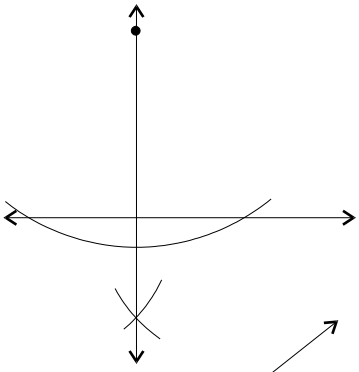


b.

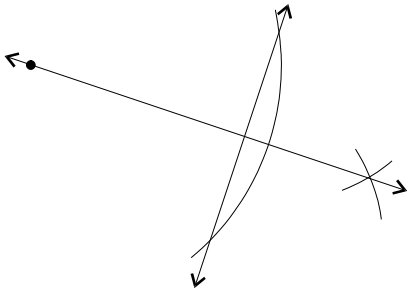


3.

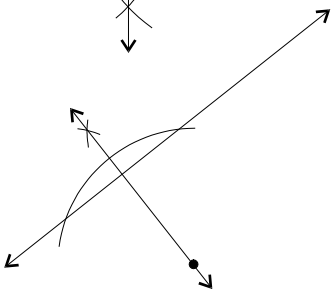
a.



b.

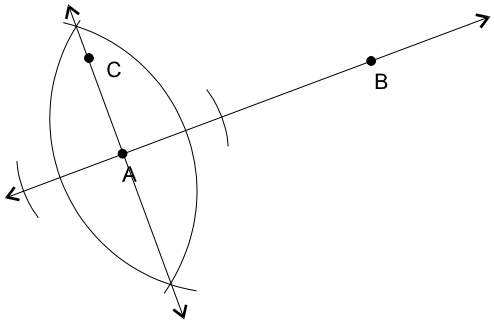


c.

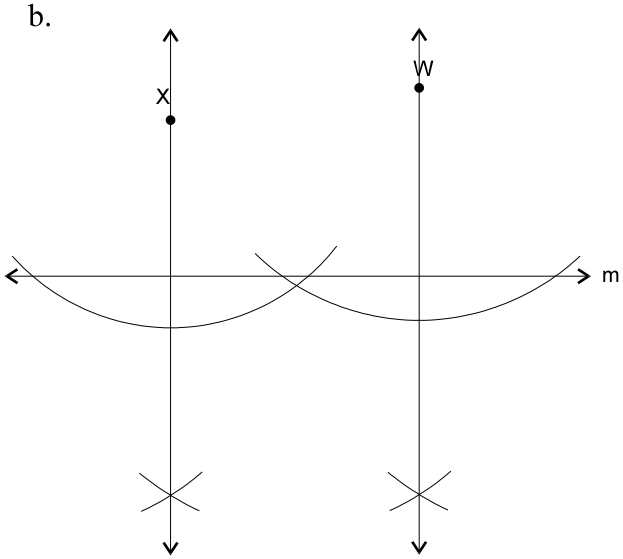


4.

a.



b.



Source: Government of BC used with permission.

CONSTRUCTION GEOMETRY 5: DRAWING TRIANGLES

1. Draw the following triangles. Label all parts.

   a. ΔABC where $\overline{AB}$ = 8 cm, $\overline{BC}$ = 5.5 cm and $\overline{AC}$ = 6 cm.

   b. ΔDEF where $\overline{DE}$ = 4 cm, $\overline{EF}$ = 3 cm and $\overline{DF}$ = 6 cm.

   c. ΔPQR where $\overline{PQ}$ = 3.5 cm, $\overline{PR}$ = 6.2 cm and $\angle P = 45°$.

d. ΔHIJ where $\overline{IJ}$ = 7 cm, $\overline{HI}$ = 7 cm and $\angle$I = 160°.

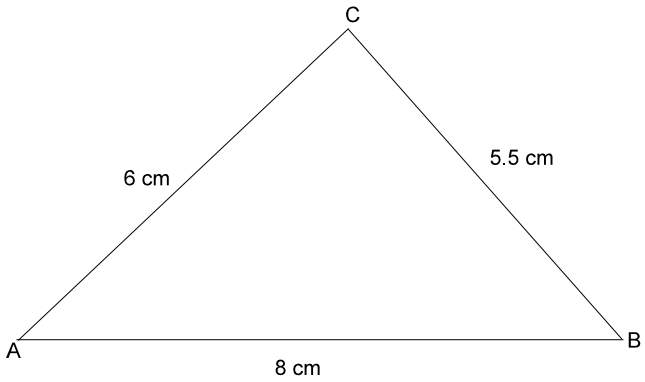
e. ΔXYZ where $\angle$X = 50°, $\angle$Y = 100° and $\overline{XY}$ = 4.8 cm.

2. Draw a triangle with angles of 50°, 30° and 100°.

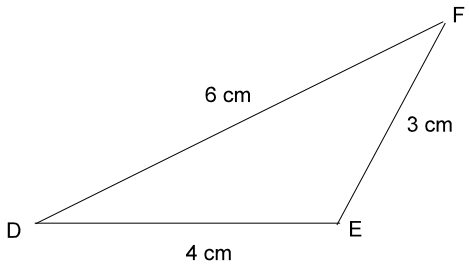
3. Draw an isosceles triangle with sides of 2 cm, 8 cm and 8 cm.

ANSWER KEY

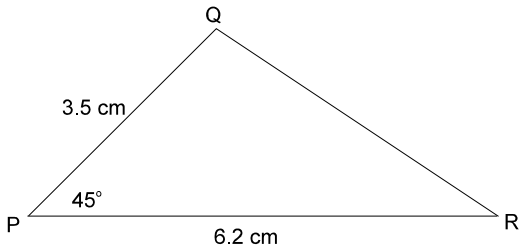
1. a.



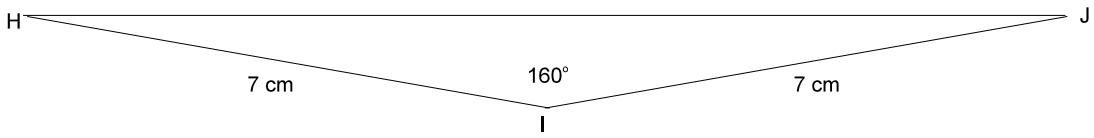
b.



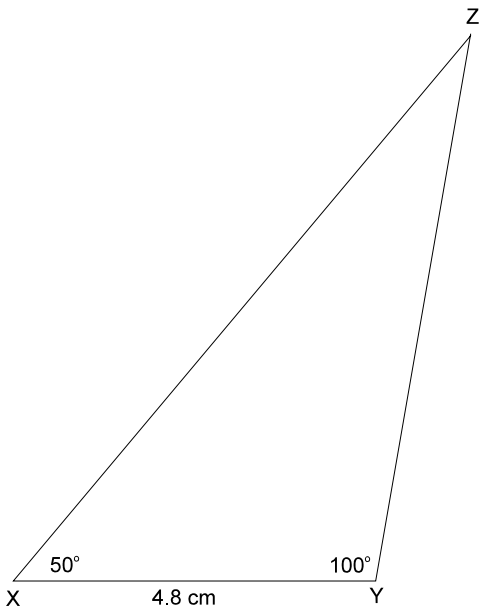
c.



d.



e.



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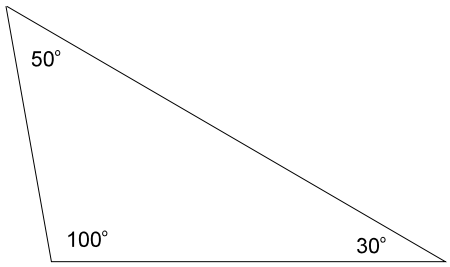

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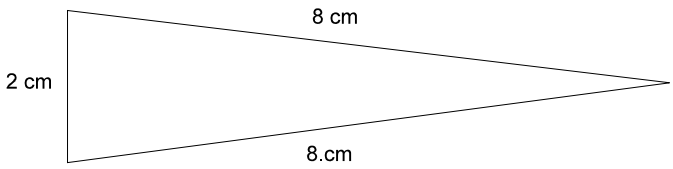

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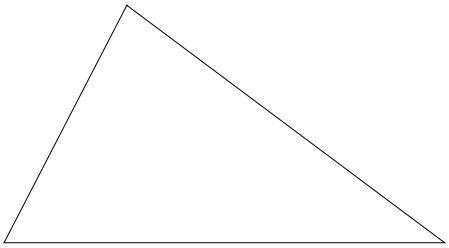
CONSTRUCTION GEOMETRY 6: DRAWING TRIANGLES

1. Draw an equilateral triangle with 5 cm sides.

2. Draw a triangle with sides of 7 cm, 2 cm and 3 cm.

3. With a compass and straightedge only, draw a triangle identical to the one below.

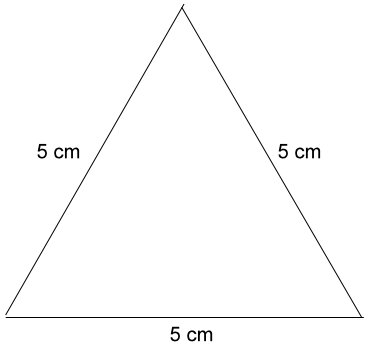


4. Draw two different triangles where:

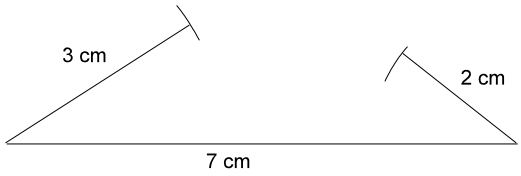
ΔABC has $\overline{AB}$ = 6 cm, $\angle A = 25°$ and $\overline{BC}$ = 5 cm.

ANSWER KEY

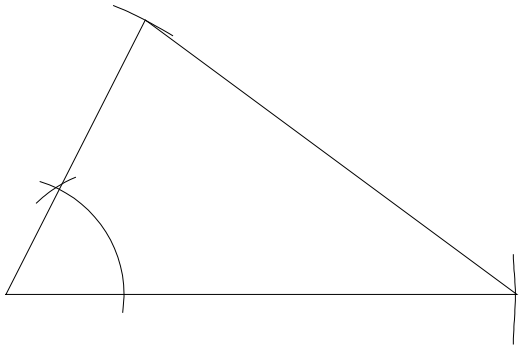
1.



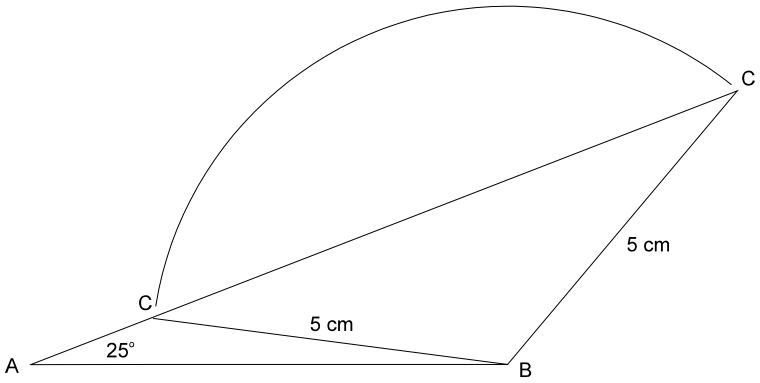
2.



3.



4.



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CONSTRUCTION GEOMETRY 7: DRAWING QUADRILATERALS

1. Draw a square with sides of 4 cm.

2. Draw a rhombus ABCD with sides of 3.5 cm and $\angle A = 50°$.

3. Draw a rectangle with sides of 2.5 cm and 6.5 cm.

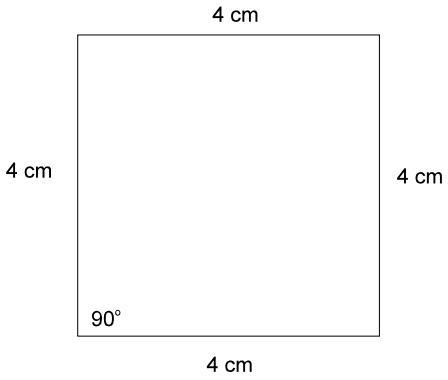
4. Draw a parallelogram MNOP where $\overline{MN}$ = 4 cm, $\angle O = 65°$ and $\overline{MP}$ = 5 cm.

5. Draw a trapezoid WXYZ where $\overline{WX}$ = 5 cm, $\angle W = 80°$, $\angle X = 60°$ and $\overline{WZ}$ = 3 cm.

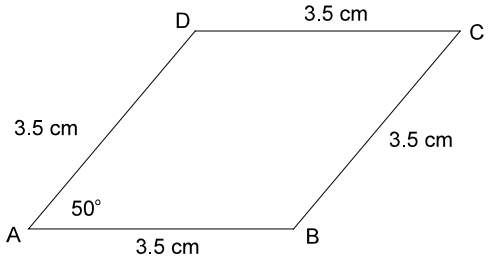
6. Draw a square with 6 cm diagonals.

ANSWER KEY

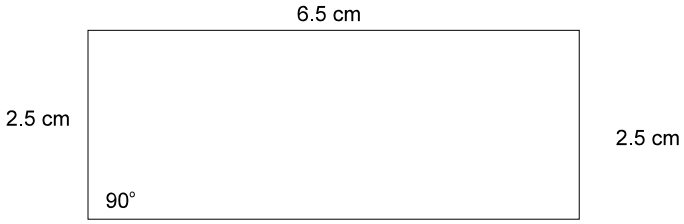
1.



2.



3.



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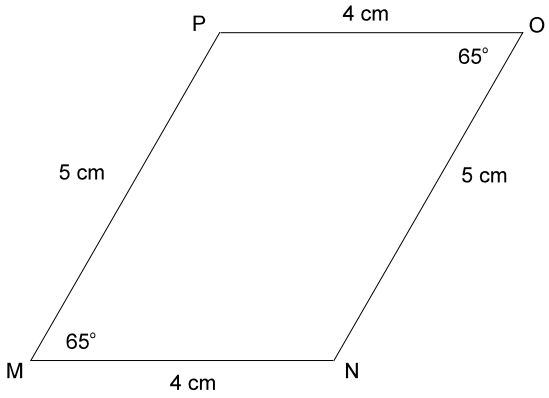

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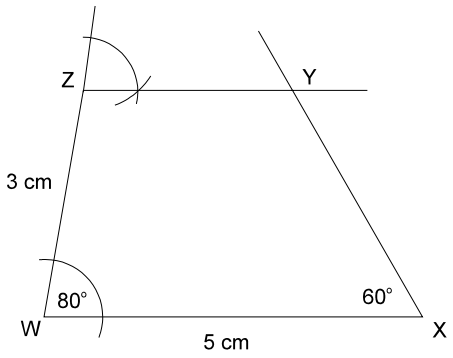

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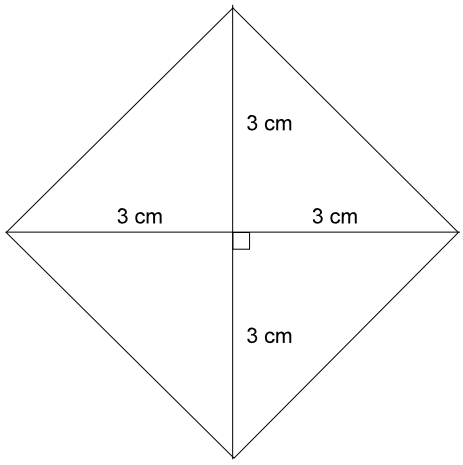

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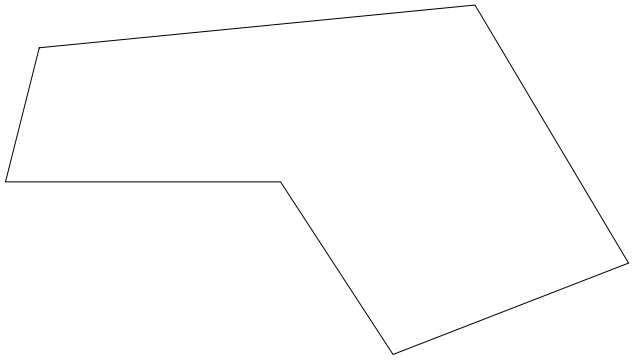
CONSTRUCTION GEOMETRY 8: DRAWING POLYGONS

1. A regular polygon must have congruent _____ and congruent _____.

2. Find the sum of the interior angles of the hexagon below.



3. Draw a regular pentagon with 4 cm sides.

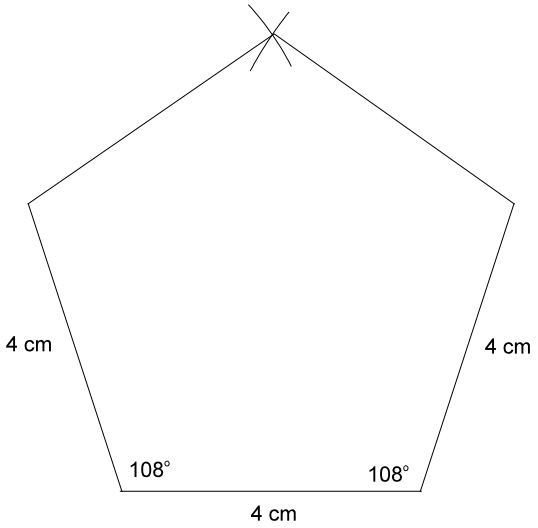
4. Draw a hexagon with 4.5 cm sides.

ANSWER KEY

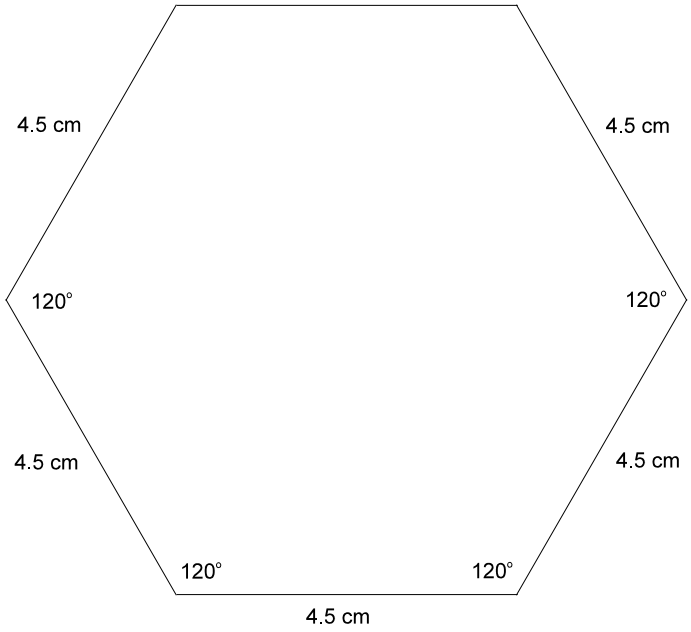
1. sides and angles

2. 720°

3.



4.



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CONSTRUCTION GEOMETRY 9: DRAWING POLYGONS

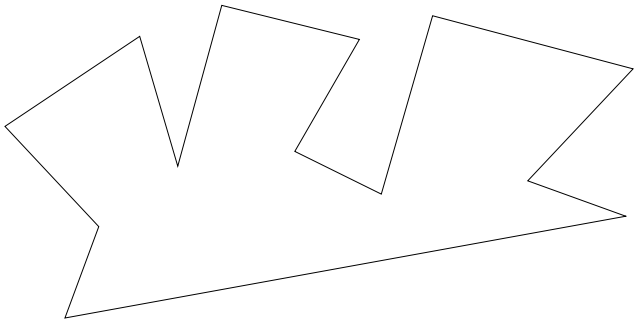
1. Draw an octagon with 6 cm sides.

2. A decagon has 10 sides.

   a. Calculate the sum of its interior angles.

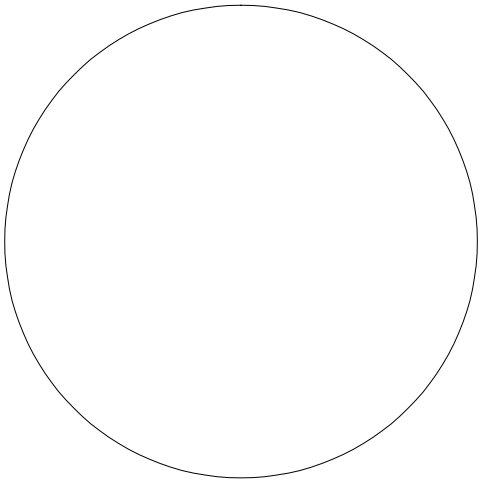
   b. What would each angle of a regular decagon measure?

3. Without using a protractor, determine the sum of the interior angles of the polygon below.

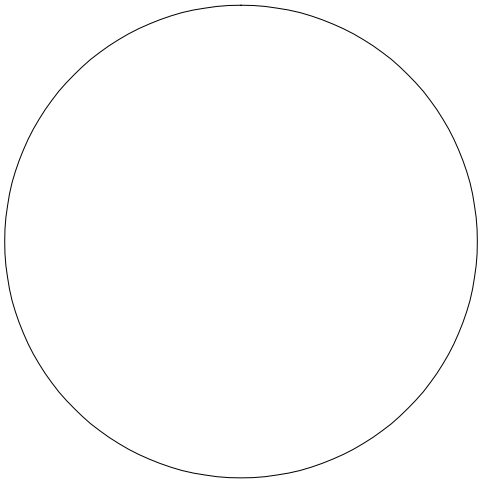


4. Inscribe the following polygons in the given circles.

a. square

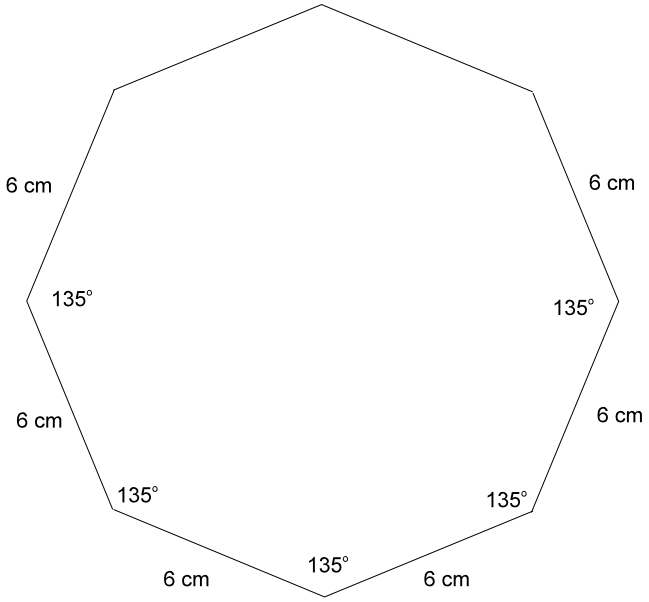


b. octagon



ANSWER KEY

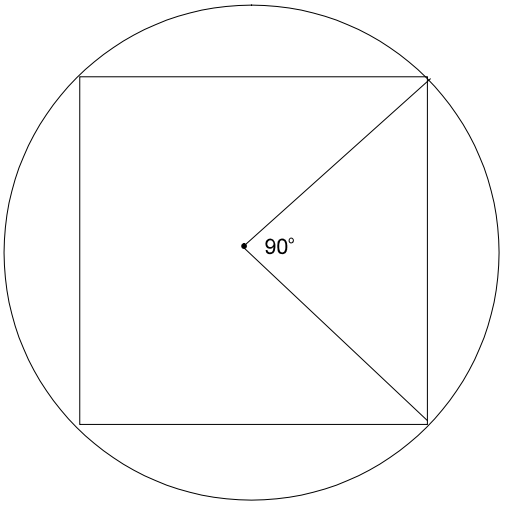
1.

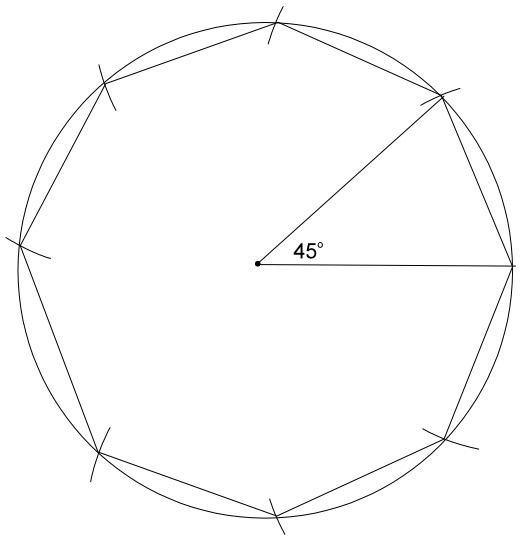


2. a. $180° \times (10 - 2) = 1440°$ b. $\frac{180° \times (10 - 2)}{10} = 144°$

3. $180° \times (13 - 2) = 1980°$

4. a. b.





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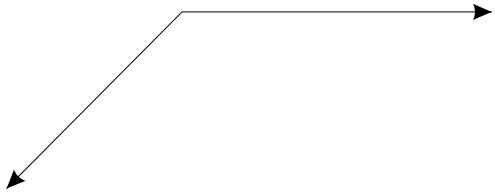
CONSTRUCTION GEOMETRY 10: SUMMARY

1. Draw the following:

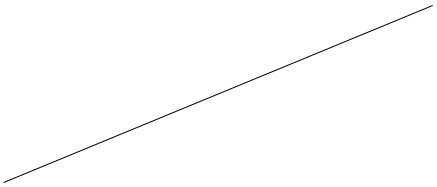
   a. A circle with a diameter of 7 cm.

   b. A sector with radii of 3 cm and an angle of 115°.

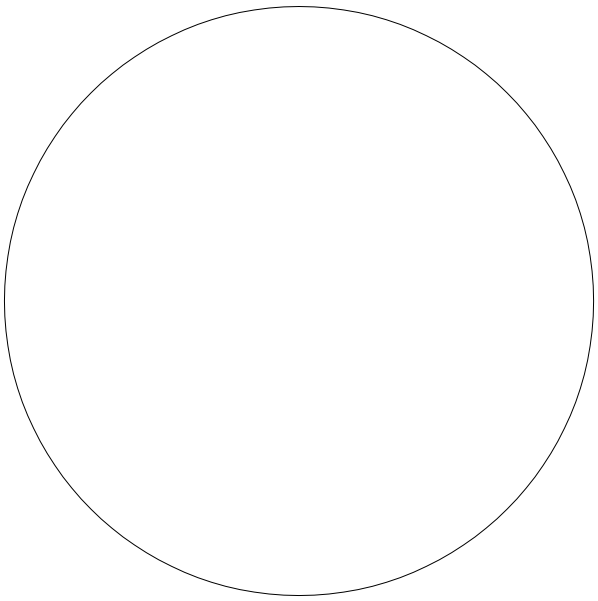
2. Bisect the obtuse angle below using a compass and straightedge.



3. Bisect the segment below using a compass and straightedge.



4. Use only a compass and straightedge to find the centre of the circle.



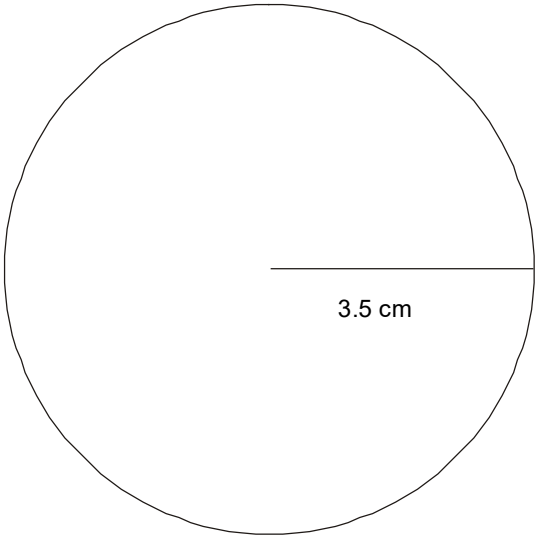
5. Draw the following triangle. Label all parts.

ΔABC where $\overline{AB}$ = 5.5 cm,

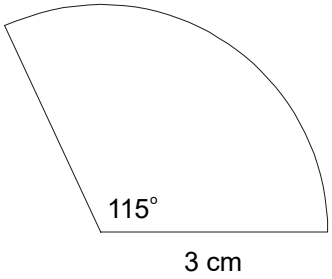
$\angle$B = 100° and $\overline{BC}$ = 4 cm

ANSWER KEY

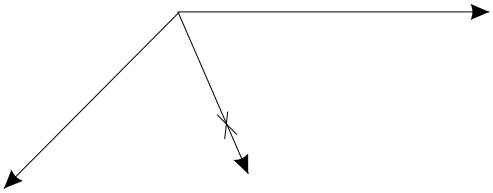
1. a.



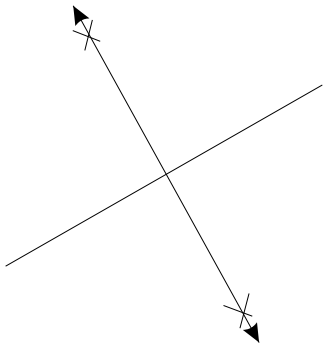
b.



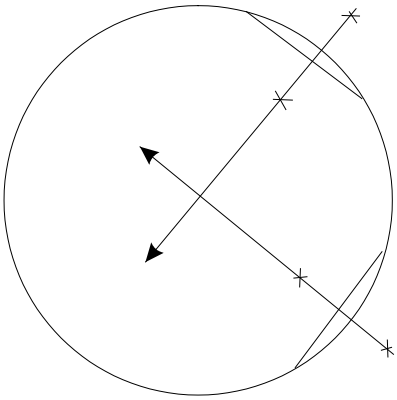
2.



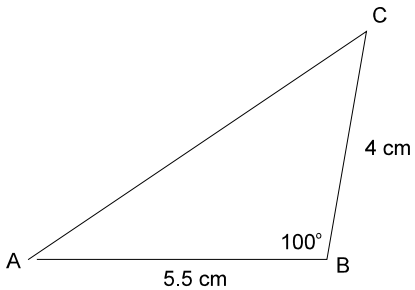
3.



4.



5.



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CONSTRUCTION GEOMETRY 11: SUMMARY

1. Draw the following triangles. Label all parts.

   a. ΔDEF where $\overline{DE}$ = 3 cm, $\overline{EF}$ = 4.3 cm and $\overline{DF}$ = 2.5 cm

   b. ΔGHI where $\angle$G = 25°, $\angle$H = 25° and $\overline{GH}$ = 7 cm

2. Draw the following polygons. Label all parts.

   a. A rectangle with sides 2.8 cm by 6.3 cm.

b. A parallelogram ABCD where $\overline{AB}$ = 4.2 cm, $\overline{AD}$ = 3 cm and $\angle A = 65°$.

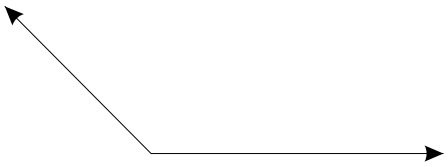
3. Construct a line which is parallel to l that passes through the point P.

4. Draw the following:

a. A circle with a diameter of 5 cm.

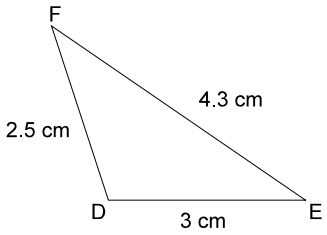
b. A sector with radii of 3 cm and an angle of 130°.

5. Bisect the angle using a compass and straightedge.

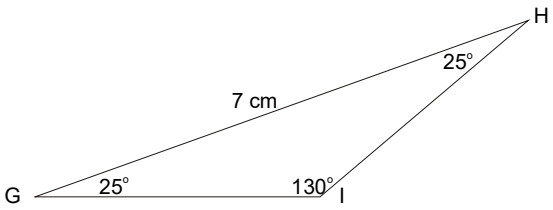


ANSWER KEY

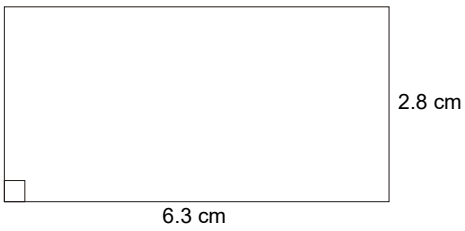
1. a.



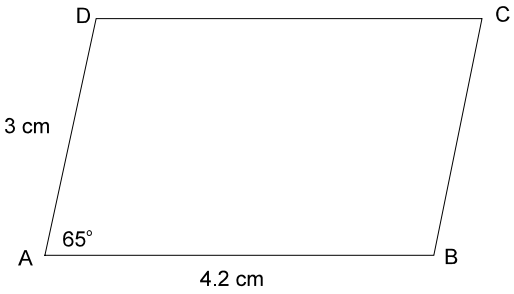
5. b.



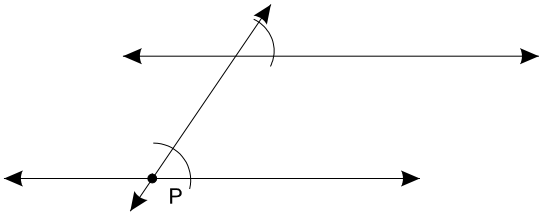
2. a.



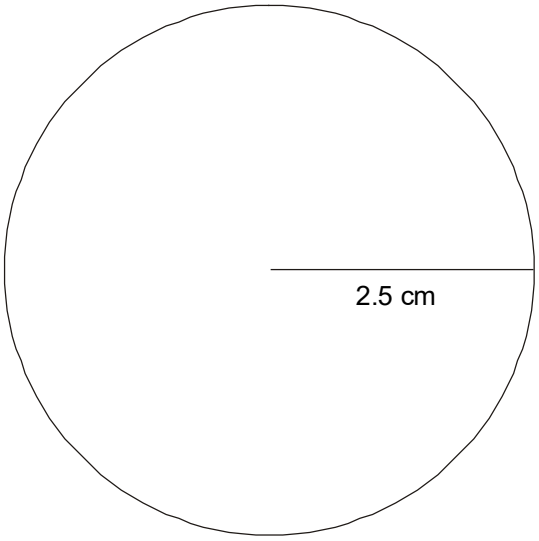
2. b.



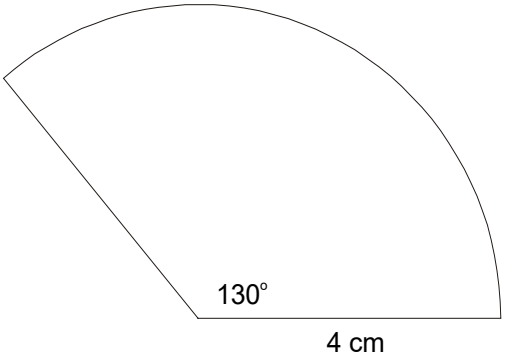
3.



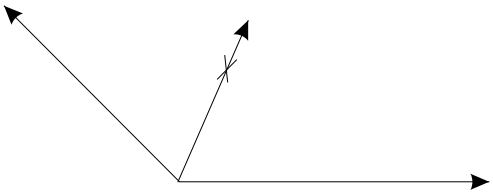
4. a.



b.



5.



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CONSTRUCTION GEOMETRY 12: SUMMARY

1. Construct the following triangles. Label all parts.

   a. ΔABC where $\overline{AB}$ = 5.7 cm, $\overline{BC}$ = 4.2 cm and $\overline{AC}$ = 2.6 cm.

   b. ΔDEF where $\overline{DE}$ = 4 cm, $\overline{EF}$ = 5 cm and $\angle$E = 115°.

   c. ΔGHI where $\overline{GH}$ = 7 cm, $\angle$G = 30° and $\angle$I = 50°.

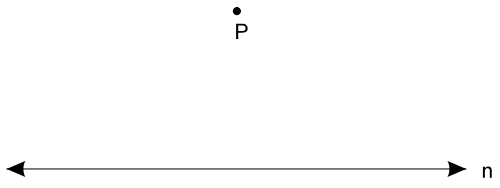
2. Construct the following polygons. Label all parts.

a. A rectangle with sides 6.3 cm by 2.7 cm.

b. A parallelogram ABCD where $\angle A = 40°$, $\overline{AB} = 5.5$ cm and $\overline{AD} = 4$ cm.

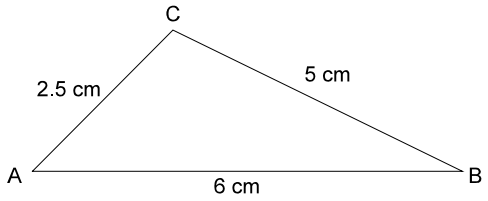
c. A rhombus with one diagonal of 10 cm and sides of 6 cm.

3. Construct a line parallel to n that passes through the point P.

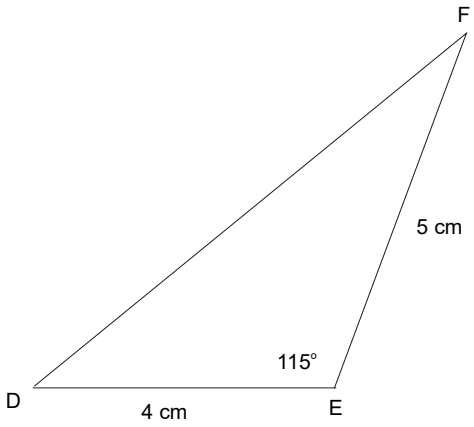


ANSWER KEY

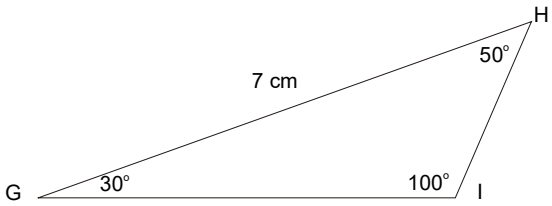
1. a.



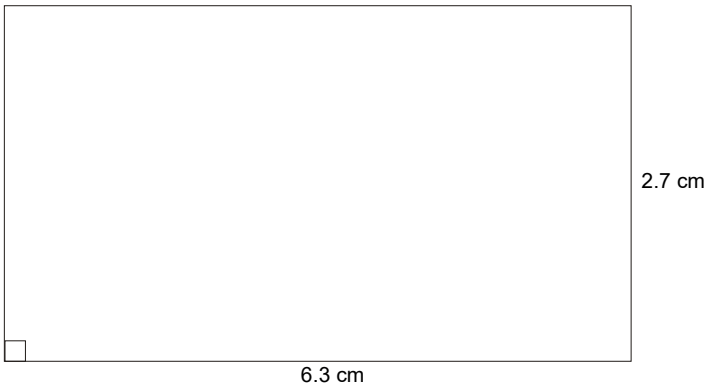
1. b.



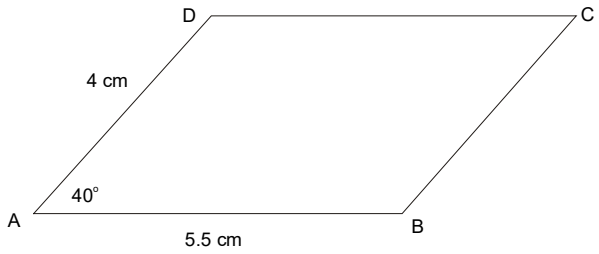
1. c.



2. a.



2. b



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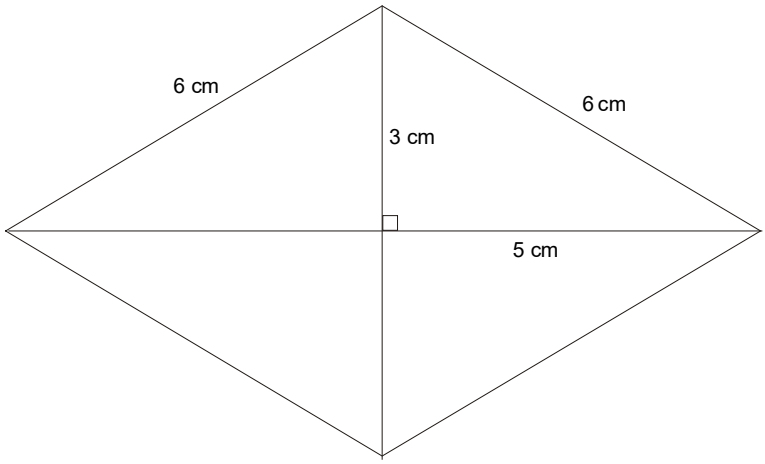
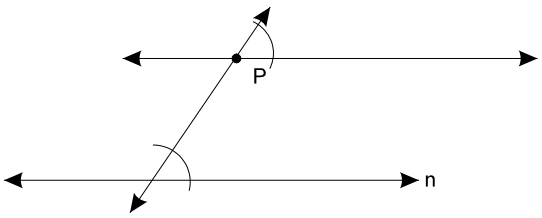
2. c.



3.



Source: Government of BC used with permission.

Algebra

ALGEBRA – EQUATIONS 1

1. $3x = -21$

2. $15 = -3x$

3. $2.6x = 0$

4. $-2a = -90$

5. $0.3x = -0.9$

6. $-28 = -2a$

7. $-\frac{1}{3}x = -4$

8. $-3y = \frac{-4}{5}$

9. $-z = -6$

10. $3 = -x$

11. $-y = -4$

12. $-x = \frac{3}{8}$

13. $-b = \frac{1}{2}$

14. $-x + 1 = 5$

ANSWER KEY

1. x = -7
2. x = -5
3. x = 0
4. a = 45
5. x = -3
6. a = 14
7. x = 12
8. y = $\frac{4}{15}$
9. a = 6
10. x = -3
11. y = 4
12. x = $\frac{-3}{8}$
13. b = $-\frac{1}{2}$
14. x = -4

ALGEBRA – EQUATIONS 2

1. $8x + 18 - 3x - 4 = 64$

2. $-4x + x - 8x = 0$

3. $9w - 2w + 10 = 31$

4. $-7 = 7m + 25 + m$

5. $10 = 2p - p + 1$

6. $27 + c + 11c - 15 = 96$

7. $19 - 3x = 4x - 2$

8. $2x - 7 = 4x + 11$

9. $3.5x - 2.4 = 3.9 + 1.4x$

10. $\frac{1}{2}x - \frac{1}{4} = \frac{3}{4}x - \frac{1}{2}$

11. 1 - m = m – 1

12. $\frac{x}{3}$ - 5 = 16

13. 3x + 6 + 9x = -4 - 3x + 7

14. 49 - 10x - 3 = 50 - 2x

15. -5 -4x -3 -2x - 1 = 0

16. 23 - x = 13 - 4x

17. 13 - 2.6x - 5 = 12x + 8

18. x + 2x + 3x = 180

19. x + 2x + 5 + 3x = 180 + x

20. 6x - 7 = 27x + 14

ANSWER KEY

1. $x = 10$
2. $x = 0$
3. $w = 3$
4. $m = -4$
5. $p = 9$
6. $c = 7$
7. $x = 3$
8. $x = -9$
9. $x = 3$
10. $x = 1$
11. $m = 1$
12. $x = 63$
13. $x = -\frac{1}{5}$
14. $x = -\frac{1}{2}$
15. $x = -\frac{3}{2}$
16. $x = -\frac{10}{3}$
17. $x = 0$
18. $x = 30$
19. $x = 35$
20. $x = -1$

ALGEBRA – EQUATIONS 3

1. $2(3x + 4) = 26$

2. $4(6 - x) = 7$

3. $3(x + 4) = 2(x - 6)$

4. $3(5x - 9) = 33$

5. $12 = -6(2x - 8)$

6. $4 = 8 + 2(3x + 1)$

7. $2x - 3 = 4(x - 1)$

8. $6 = 2(5x - 4)$

9. $3(2x - 5) - 6(5x - 3) = 0$

10. $0.5(4m - 30) = 7$

11. $2x - 3(x + 4) = 6 + 7x$

12. $3 - (3x + 5) = -4$

13. $0.6(2x - 1.4) = 1.8$

14. $1 - 2(3 - 4x) = 5x + 6$

15. $1 - (1 - x) = 1$

16. $x - (x - 1) = x$

17. $5 - (6 - 3a) = 7 + 11a$

18. $2(x - 3) - (2x + 6) = 4x$

19. $4\left(\frac{1}{2}x - 3\right) = x - 22$

20. $44 - 16x = 25(3 - x)$

ANSWER KEY

1. $x = 3$
2. $x = \frac{17}{4}$
3. $x = -24$
4. $x = 4$
5. $x = 3$
6. $x = -1$
7. $x = \frac{1}{2}$
8. $x = \frac{7}{5}$
9. $x = \frac{1}{8}$
10. $m = 11$
11. $x = -\frac{9}{4}$
12. $x = \frac{2}{3}$
13. $x = 2.2$
14. $x = 3\frac{2}{3}$
15. $x = 1$
16. $x = 1$
17. $a = -1$
18. $x = -3$
19. $x = -10$
20. $x = \frac{31}{9}$

ALGEBRA – EQUATIONS 4

1. When 18 is subtracted from 6 times a certain number the result is 96. What is the number?

2. The perimeter of a rectangle is 37 cm. The length is 1 cm less than twice the width. Find the length and width.

3. The width of a rectangular-shaped garden is 5 m less than twice the length. The perimeter is 14 m. Find the length and width.

4. If you add two-fifths of a number to the number itself, you get 56. What is the number?

5. If you add one-third of a number to the number itself, you get 48. What is the number?

6. A 180 m rope is cut into three pieces. The second piece is twice as long as the first. The third piece is three times as long as the second. How long is each piece?

7. The second angle of a triangle is three times as large as the first. The third angle is 10° more than the first. Find the measure of each angle.

8. Briana and Steve prune trees. Steve pruned three-quarters as many trees as Briana. Together they pruned 140 trees. How many did each prune?

ANSWER KEY

1. 19
2. width = 6 ½ cm, length = 12cm
3. length = 4m, width = 3m
4. 40
5. 36
6. 20m, 40m, 120m
7. 34°, 102°, 44°
8. Briana = 80 trees, Steve = 60 trees

ALGEBRA – POLYNOMIALS 1

1. For the polynomial $17x^2 – x$:

   a. identify the terms _____

   b. identify the coefficients of each term _____

   c. name the polynomial _____

2. Evaluate the following:

   a. $2b^2 - 5b + 3$ for b = -1 _____

   b. 2L + 2W for L = 7 and W = 9 _____

3. Add or subtract as indicated and simplify.

   a. $10x^2 + 3x - 9 + 2x - 10x^2 + 2$ _____

   b. $(a^3 + 7a + 3) + (5a^3 - 9)$ _____

   c. $5y^2 - (y^2 + y - 1)$ _____

   d. $(12n^3 - 3n) - (6n + 2)$ _____

4. Multiply and simplify.

   a. $-2x(x^2 - 3x +5)$ _____

   b. $(3a^2b^3)(-4a^2b)$ _____

   c. $(2x - 1)(x + 3)$ _____

5. Divide and simplify. (4 marks)

   a. $(-18a^2b^2 + 9ab^2 - 27b^2) \div 9b^2$ _____

   b. $\frac{-4x^3y^2}{-8x^2y^2}$ _____

6. Factor the following.

a. $4m - 2m^2$ _____

b. $x^5 - x^4 + x^3$ _____

c. $18a^2b^3 + 6a^2b^2 - 12a^2b$ _____

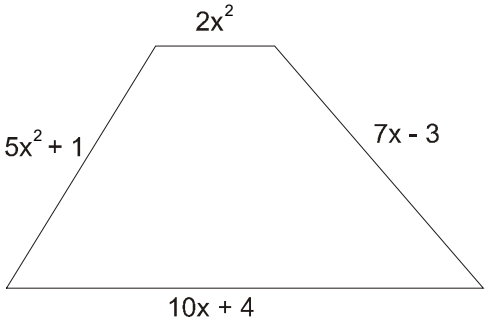
7. Solve the formula for the variable indicated.

a. $A = \frac{1}{2} bh$ for b _____

b. $C = \frac{5}{9}(F - 32)$ for F _____

c. $y = mx + b$ for m _____

8. Find the perimeter of the figure below.



_____

ANSWER KEY

1. a. $17x^2$, $-x$ b. 17, -1 c. binomial

2. a. 10 b. 32

3. a. $5x - 7$ b. $6a^3 + 7a - 6$
   c. $4y^2 - y + 1$ d. $12n^3 - 9n - 2$

4. a. $-2x^3 + 6x^2 - 10x$ b. $-12a^4b^4$ c. $2x^2 + 5x - 3$

5. a. $-2a^2 + a - 3$ b. $\frac{x}{2}$ or $\frac{1}{2}x$

6. a. $2m(2 - m)$ b. $x^3(x^2 - x + 1)$ c. $6a^2b(3b^2 + b - 2)$

7. a. $b = \frac{2a}{h}$ b. $F = \frac{9}{5}c + 32$ c. $m = \frac{y - b}{x}$

8. $7x^2 + 17x + 2$

Source: Government of BC used with permission.

ALGEBRA – POLYNOMIALS 2

1. For the polynomial $x^2 + 7x - 3$:

   a. identify the terms _____

   b. identify the coefficients of each term _____

   c. name the polynomial _____

2. Evaluate the following:

   a. ½ bh for b = 3 and h = 10 _____

   b. $x^3 + 2x - 1$ for x = -2 _____

3. Add or subtract as indicated and simplify.

   a. $(3x^2 + x - 1) + (x^2 - 3x + 7)$ _____

   b. $15ab^2 - 8ab + ab - 3ab^2$ _____

   c. $(5w^2 - 2w) - (10w^2 + 3w)$ _____

   d. $(7x + 3y - z) - (7x + 3y + z)$ _____

4. Multiply and simplify.

   a. $(-c^2d)(-2cd^2)$ _____

   b. $3y(5y^2 + y - 7)$ _____

   c. $(x - 5)(3x + 2)$ _____

5. Divide and simplify.

   a. $(12x^2y - 16xy + 4y) \div 4y$ _____

   b. $\frac{30cd^2}{-5cd}$ _____

6. Factor the following.

a. $6x^2 - 3x^2y$ _____

b. $5ab - 10ac - 15a$ _____

c. $14a^2b^2 - 7ab^2 + 21a^2b^3$ _____

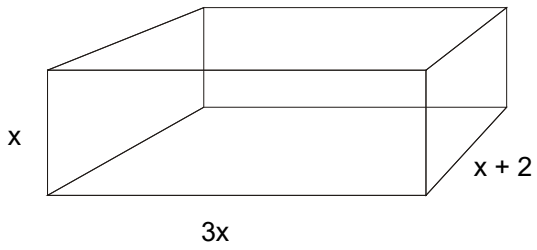
7. Solve the formula for the variable indicated.

a. $P = 2L + 2W$ for W _____

b. $I = Prt$ for t _____

c. $A = \frac{a + b + c}{3}$ for a _____

8. Find the volume of the figure below.



_____

ANSWER KEY

1. a. x^2, 7x, -3 b. 1, 7 c. trinomial

2. a. 15 b. -13

3. a. $4x^2 - 2x + 6$ b. $12ab^2 - 7ab$ c. $-5w^2 - 5w$ d. -2z

4. a. $2c^3d^3$ b. $15y^3 + 3y^2 - 21y$ c. $3x^2 - 13x - 10$

5. a. $3x^2 - 4x + 1$ b. -6d

6. a. $3x^2(2 - y)$ b. $5a(b - 2c - 3)$ c. $7ab^2(2a - 1 + 3ab)$

7. a. $W = \frac{P - 2L}{2}$ or $W = \frac{1}{2}P - L$ b. $t = \frac{I}{Pr}$ c. a = 3A - b - c

8. $3x^3 + 6x^2$

Trigonometry

TRIGONOMETRY 1

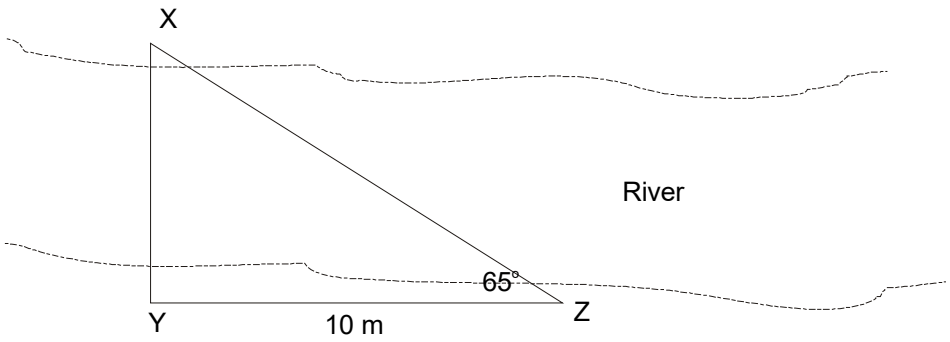
Read each question carefully, then draw a diagram.

1. Pat wants to know the height of a tree in her yard. She observes that from a distance of 20 m from the tree, the angle of elevation to the top of the tree is 32°. What is the height of the tree to the nearest tenth of a metre?

2. From a lighthouse 16 m above sea level, the angle of depression to a small boat is 12°. How far from the foot of the lighthouse is the boat to the nearest metre?

3. A kite is 40 m high when 210 m of string is used. What angle does the kite make with the horizontal to the nearest degree?

4. Marianne wants to know how far it is across a river. She notices a tree at point X straight across from point Y. She walks 10 m along the river bank to point Z and observes that the angle to the tree is 65°. What is the distance across the river from point X to point Y to the nearest hundredth of a metre?



5. A plot of land has the shape of a right triangle. The longest side is 37 m and lies at an angle of 53° to the shortest side. Find the area of the plot to the nearest square metre.

ANSWER KEY

1. 12.5 m
2. 75 m
3. 11°
4. 21.45 m
5. 329 m^2

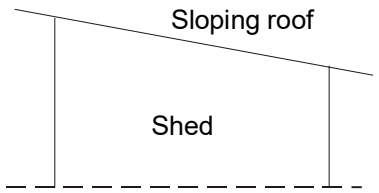
Source: Government of BC used with permission.

TRIGONOMETRY 2

Read each question carefully, then draw a diagram.

1. A painter is using a ladder to paint a high factory wall. The ladder is 5 m long and for safety, must never be used at an angle to the vertical of less than 15° or more than 40°. If he can reach 1 m above the top of the ladder, what is the maximum height to the nearest tenth of a metre that he can paint? (Hint: what angle would give the painter the greatest height?)

2. Raj is building a garden shed of his own design. It has a simple sloping roof. The two walls on which the roof will rest are 3.2 m apart and one wall is 0.5 m higher than the other. Allowing 0.25 m for overhang at either end, how long (to the nearest hundredth) will the roof beams have to be? What will the slope of the roof be to the nearest degree with respect to the horizontal?



3. Joan is welding a piece of modern sculpture. Part of the design includes an A-frame structure. Joan wants the two thin bars that make up the sides of the frame to form an angle of 54° at the top and she wants the frame to be 2.2 m high. How long will each bar have to be to the nearest thousandth? (Hint: you need a right triangle to use a trigonometric ratio.)

4. A new ski-lift is being built at the slopes. The base of the lift is at an elevation of 2500 m, but the elevation of the top station is not accurately known. A survey of the site shows the base and the top station are 2450 m apart in horizontal distance and a line of sight to the top station angles up at 38°. Find the length of steel cable (to the nearest 10 m) that will be needed for the endless loop on which the chairs will hang. Allow for an additional 5% of the total length for sags, joining, etc.

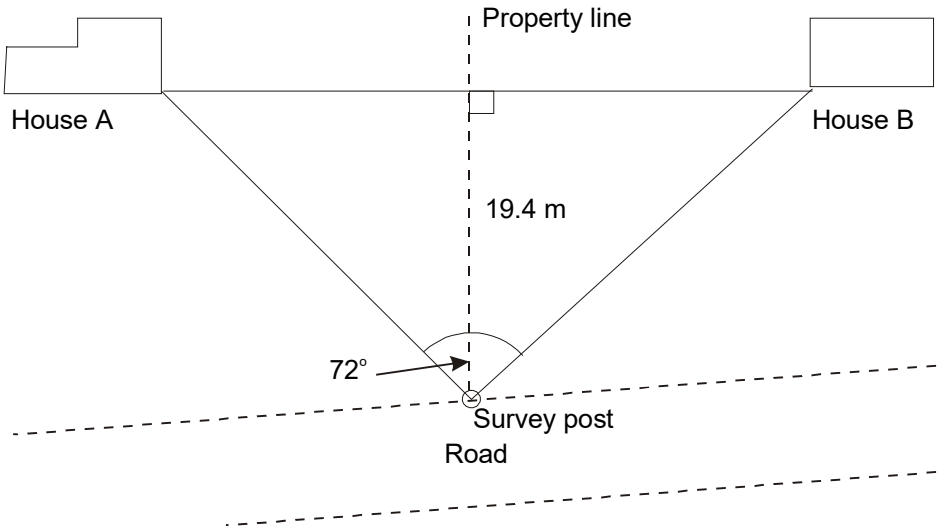
5. The roof of a small pup tent is made of a rectangular piece of material. If the tent is to be 2.2 m long, the roof sloping up at 48° to the horizontal and with the poles 1.4 m high, how many square metres of material will be needed to make the tent to the nearest hundredth?

ANSWER KEY

1. 4.2 m
2. roof beams are 3.73 m long, slope is 9°
3. 2.469 m
4. 6530 m
5. 8.27 m^2

TRIGONOMETRY 3

1. Given that the property line is halfway between the two houses on the plan below, what is the distance between the two houses to the nearest tenth of a metre?



2. How far is the corner of house B from the survey post to the nearest tenth of a metre?

3. A carpenter is instructed to cut a right-angled wooden wedge 25 cm long in the base with an angle of 12°. How long will the sloping surface of the wedge be to the nearest millimetre?

4. From a ladder, Wayne looks at a building 35 m away. He notes that the angle of elevation to the top of the building is 19° and the angle of depression to the bottom of the building is 7°. How high is the building?

5. A slide in the Water Park is 9 m high. If the actual length of the slide is 14 m, what angle does the slide make with the horizontal?

ANSWER KEY

1. 28.2 m
2. 24.1 m
3. 256 mm
4. 16.3 m
5. 40^{o}

TRIGONOMETRY 4

1. Find the following. Round answers to 4 decimal places.

   a. cos 82° _____

   b. tan 5.6° _____

   c. sin 0.77° _____

2. Find ∠A (in degrees) for each of the following. Round to one decimal place.

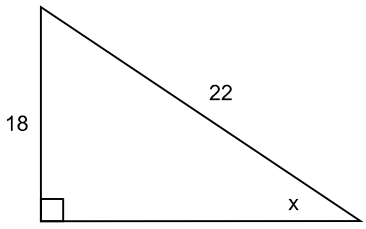
   a. sin ∠A = 0.9321 _____

   b. tan∠A = 2.563 _____

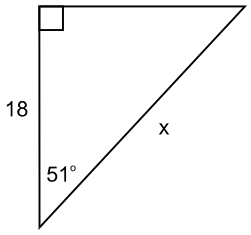
   c. cos∠A = 0.089 _____

3. Find ∠x or side x in each of the following. Round answers to one decimal place.

   a.

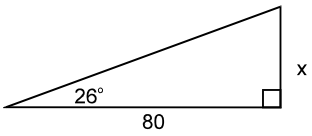
   b.

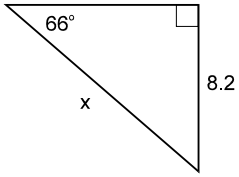
   a. _____

   b. _____

   c.

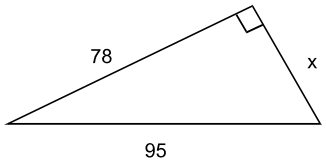
   d.

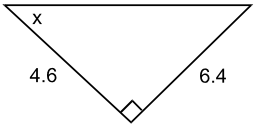
   c. _____

   d. _____

   e.

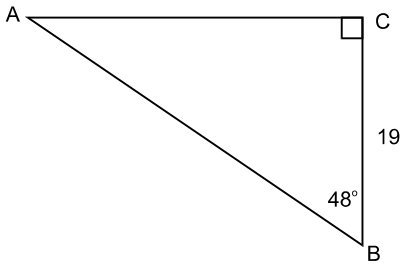
   f.

   e. _____

   f. _____

4. Solve ΔABC. Round your answers to one decimal place.



$\overline{AC}$ = _____

$\overline{AB}$ = _____

$\angle A$ = _____

5. Vicki estimates the distance from a large rock to the base of a vertical cliff to be 43 m. Standing by the large rock, the angle between the ground and her line of sight to the top of the cliff is about 57°. Estimate the height of the cliff.

Height of the cliff = _____

6. What angle does a 7.5 m ladder make with a wall if the top of the ladder is 6 m above the ground?

Angle of the ladder = _____

ANSWER KEY

1. a. 0.1392 b. 0.0981 c. 0.0134

2. a. 68.8° b. 68.7° c. 84.9°

3. a. 54.9° b. 28.6 c. 39.0 d. 9.0 e. 54.2
   f. 54.3°

4. a. 21.1 b. 28.4 c. 42°

5. 66.2 m

6. 36.9°

Source: Government of BC used with permission.

TRIGONOMETRY 5

1. Find the following: Round your answers to 4 decimal places.

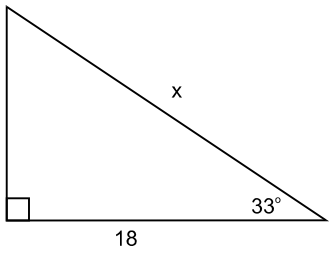
   a. sin 16° _____
   b. tan 80.5° _____
   c. cos 0.3° _____

2. Find ∠A (in degrees) for each of the following. Round your answer to one decimal place.

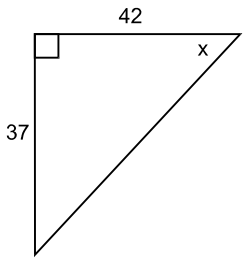
   a. tan ∠A = 1.093 _____
   b. sin ∠A = 0.5555 _____
   c. cos ∠A = 0.065 _____

3. Find ∠x or side x in each of the following. Round your answers to one decimal place.

a.



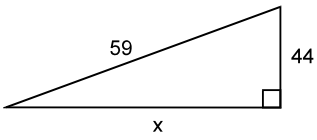
b.



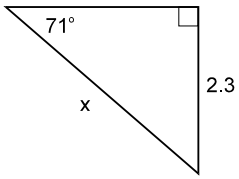
a. _____

b. _____

c.



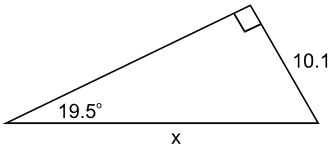
d.



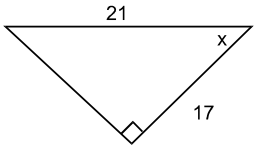
c. _____

d. _____

e.



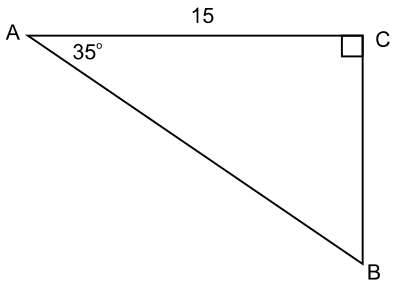
f.



e. _____

f. _____

4. Solve ΔABC. Round your answers to one decimal place.



$\overline{AB}$ = _____

$\overline{BC}$ = _____

$\angle B$ = _____

5. A 6.5 m ladder makes an angle of 22° with a wall. How high up the wall does the ladder reach? Round your answers to one decimal place.

Height of the ladder = _____

6. Bill is in an apartment building 58 m above the ground. In the distance he can see a tall tree. The angle between the building and his line of sight to the base of the tall tree is 85.5°. How far is the tree from the foot of the building?

Distance to the tree = _____

ANSWER KEY

1. a. 0.2756 b. 5.9758 c. 1.0000
2. a. 47.5° b. 33.7° c. 86.3°
3. a. 21.5 b. 41.4° c. 39.3 d. 2.4 e. 30.3
   f. 36°
4. 18.3, 10.5, 55°
5. 6 m
6. 737

Measurement

Source: Government of BC used with permission.

MEASUREMENT 1

1. Measure the length of the bar in mm and cm.

cm _____

mm_____

2. Determine the following:

a. What is the freezing temperature of water in celsius? _____

b. Which of the following temperatures represents a comfortable room temperature?

5°C, 10°, 20°C or 30°C

_____

3. Make the following conversions:

a. 109 mm = _____ cm

b. 0.0038 t = _____kg

c. 4.3 ha = _____ m^2

d. 0.26 L = _____ cm^3

e. 48 h = _____ min

f. 6 840 cm^2 = _____ m^2

g. 0.000 52 km = _____ m

h. 93 000 000 g = _____kg

i. 2.84 m = _____ mm

j. 0.00615 km^2 = _____ m^2

k. 3 h 25 min = _____ min

4. Find the area of the rectangle in cm^2. _____

5. A rectangular lot measures 150 m $\times$ 400 m.

   a. Find the area in m^2 _____

   b. How many hectares is this lot? _____

6. Make the following conversions:

   a. 3.5 L of water = _____ kg of water

   b. 18 g of water = _____ mL of water

   c. 0.92 t of water = _____ L of water

   d. 0.06 L of water = _____ g of water

ANSWER KEY

1. 10.5 cm, 105 mm

2. a. 0°C b. 20°C

3. a. 10.9 cm b. 3.8 kg c. 43 000 m^2 d. 260 cm^3 e. 2880 min
   f. 0.684 m^2 g. 0.52 m h. 93 000 kg i. 2840 mm j. 6150 m^2
   k. 205 min

4. 12.8 or 13 cm^2 (approximately)

5. a. 60 000 m^2 b. 6 ha

6. a. 3.5 kg b. 18 ml c. 920 L d. 60 g

Source: Government of BC used with permission.

MEASUREMENT 2

1. A wall measures 9.6 m × 3.2 m.

   a. Find the area. _____

   b. If 1 litre of paint covers 12 m^2 how many litres of paint is needed to double-coat this wall? _____

2. A rectangular tank measures 60 cm × 80 cm × 50 cm.

   a. Find the volume. _____

   b. How much water will it hold in litres? _____

3. A freezer compartment measures 1.2 m × 0.5 m × 0.4 m.

   a. Find the volume. _____

   b. How many one-litre bricks of ice cream will it hold? _____

4. Joan is 5 feet, 8 inches tall. How tall is she in cm and m?

   cm _____

   m _____

5. A salmon's mass is 2.8 kg. The cookbook says to cook it 20 minutes per pound. How long should the salmon be cooked? _____ hrs _____ min

6. The 1500 metre race is sometimes called the "metric mile". Which race is longer, the 1500 metre race or the mile and by how many metres? _____ m

7. An old road map suggests that the distance from Salmon Arm to Vancouver is 310 miles. How long would a return trip from Salmon Arm to Vancouver be in km? _____

8. The conversion for km per litre to miles per gallon is:

   1 km/L = 2.82 mi/gal

   Peter's car gets 12 km/L. How many miles per gallon is this? _____

ANSWER KEY

1. a. 30.7 m^2 5.12 ≈ 6 L

2. a. 240 000 cm^2 b. 240 L

3. a. 0.24 m^3 or 240 000 cm^3 b. 240

4. 172.7 cm 1.7 m

5. 2 hours 3.2 min

6. the mile race by 110 m

7. 998.2 km

8. 33.84 mi/gal

Source: Government of BC used with permission.

MEASUREMENT 3

1. Measure the length of the bar in mm and cm.

cm _____

mm_____

2. Determine the following:

a. What is the boiling temperature of water in celsius? _____

b. Which of the following temperatures represents a cool day in British Columbia?

0°C, 10°, 20°C or 30°C

_____

3. Make the following conversions:

a. 605 mm = _____ cm

b. 0.0025 t = _____kg

c. 0.43 ha = _____ m^2

d. 8.2 L = _____ cm^3

e. 24 h = _____ min

f. 9 840 cm^2 = _____ m^2

g. 0.000 35 km = _____ m

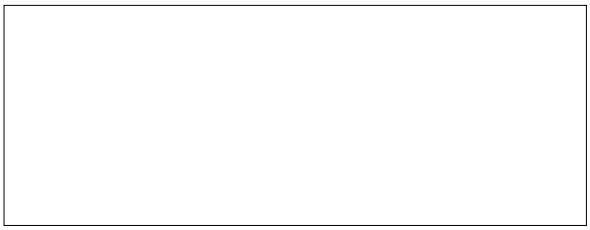
h. 63 400 g = _____kg

i. 0.156 m = _____ mm

j. 0.0028 km^2 = _____ m^2

k. 5 min 20 s = _____ s

4. Find the area of the rectangle in cm^2. _____



5. A rectangular lot measures 250 m × 300 m.

   a. Find the area in m^2. _____

   b. How many hectares is this lot? _____

6. Make the following conversions:

   a. 5.9 L of water = _____ kg of water

   b. 36 g of water = _____ mL of water

   c. 0.52 t of water = _____ L of water

   d. 0.08 L of water = _____ g of water

ANSWER KEY

1. 11.7 cm 117 mm

2. a. 100°C b. 10°C

3. a. 60.5 cm b. 2.5 kg c. 4300 m^2 d. 8200 cm^3 e. 1440 min
   f. 0.984 m^2 g. 0.35 m h. 63.4 kg i. 156 mm j. 2800 m^2
   k. 320 s

4. 22.6 cm^2 (approximately)

5. a. 75 000 m^2 b. 7.5 ha

6. a. 5.9 kg b. 36 ml c. 520 L d. 80 g

Source: Government of BC used with permission.

MEASUREMENT 4

1. A wall measures 11.5 m × 2.8 m.

   a. Find the area. _____

   b. If 1 litre of paint covers 12 m^2 how many litres of paint are needed to double-coat this wall? _____

2. A rectangular tank measures 80 cm × 120 cm × 50 cm.

   a. Find the volume. _____

   b. How much water will it hold in litres? _____

3. A freezer compartment measures 1.1 m × 0.3 m × 0.6 m. (2 marks)

   a. Find the volume. _____

   b. How many one-litre bricks of ice cream will it hold? _____

4. An old atlas states that Canada is about 3.85 million square miles in area. What is the area of Canada in km^2? _____

5. A roast has a mass of 1.8 kg. The cookbook says to cook it 30 minutes per pound. How long should the roast be cooked? _____ hrs _____ min

6. The 6-mile race is very similar to the metric 10 000 metre race. Which race is longer and by how many metres? _____ m

7. On the basketball program, Olga's height is listed as being 190.5 cm. How tall is she in feet and inches? _____

8. The conversion for km per litre to miles per gallon is:

   1 km/L = 2.82 mi/gal

   If Therese's truck only gets 4 km/L, how many miles per gallon is this? _____

ANSWER KEY

1. a. 32.2 m^2 b. 5.4 L or 6 L

2. a. 480 000 cm^3 b. 480 L

3. a. 0.198 $m^3 \approx$ 198 000 cm^3 b. 198

4. 9 979 585 km^2 or 10 million km^2

5. 1 hour 58.8 min

6. The 10 000 m race by 340 m.

7. 6 feet 3 inches

8. 11.28 mi/gal

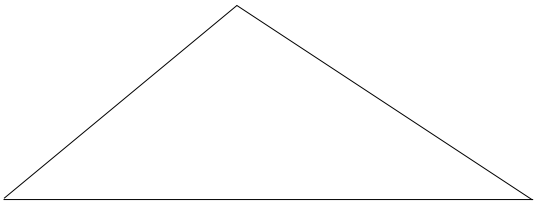
Source: Government of BC used with permission.

Perimeter, Area, Volume

PERIMETER, AREA & VOLUME 1

1. Find the perimeter (P) and area (A) of each figure below. Measure in centimetres.

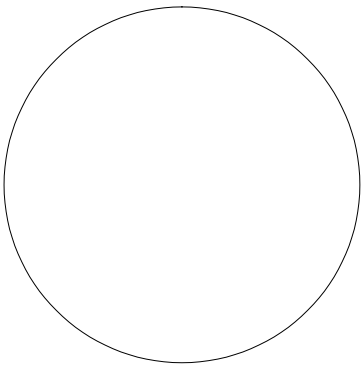
a.



a. P = _____

A = _____

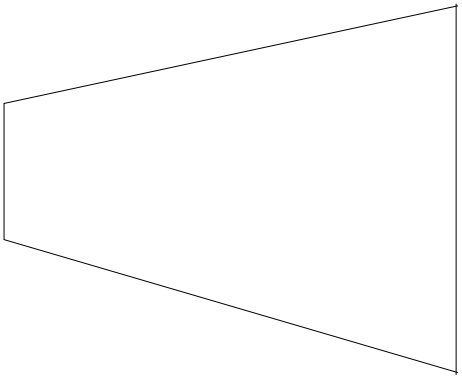
b.



b. P = _____

A = _____

c.



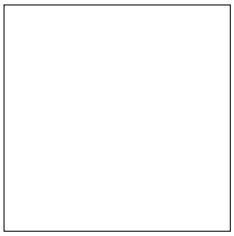
c. P = _____

A = _____

d. P = _____

A = _____

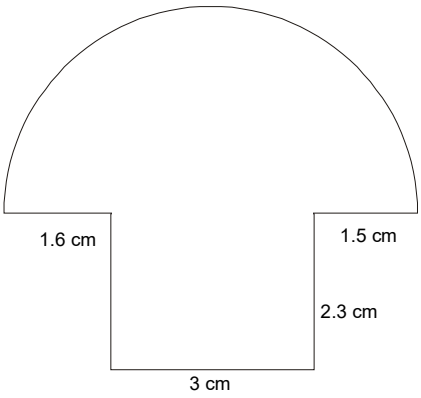
d.



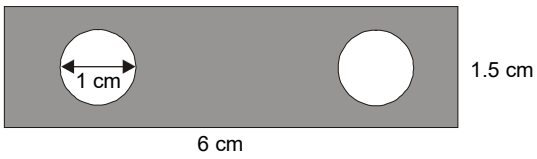
e. P = _____

A = _____

e.



2. Find the area of the shaded figure. _____



ANSWER KEY

(Answers may vary due to printing of diagrams)

1. a. P = 15.7 cm, A = 8.8 cm^2

   b. P = 14.4 cm, A = 16.6 cm^2

   c. P = 19.2 cm, A = 20.7 cm^2

   d. P = 12 cm, A = 9 cm^2

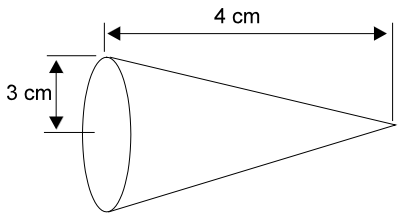
   e. P = 20.1 cm, A = 21.3 cm^2

2. 7.4 cm^2

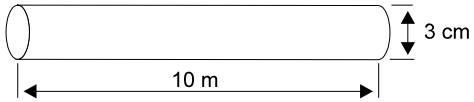
Source: Government of BC used with permission.

PERIMETER, AREA & VOLUME 2

1. Find the volume (V) of the cone. _____

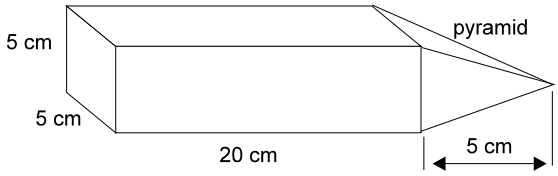


2. Find the volume of the cylinder in cm^3. _____



3. Find the volume of a sphere with a diameter of 4 cm. _____

4. Find the volume of the solid. _____



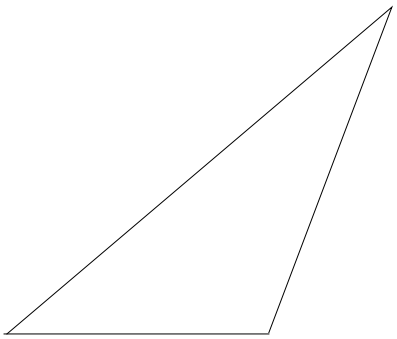
5. Find the perimeter (P) and area (A) of each figure. Measure in centimetres.

a.

a. P = _____

A = _____

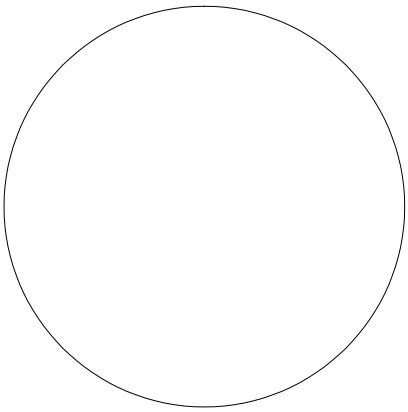
b.



b. P = _____

A = _____

c.



c. P = _____

A = _____

ANSWER KEY

(Answers may vary due to printing of diagrams)

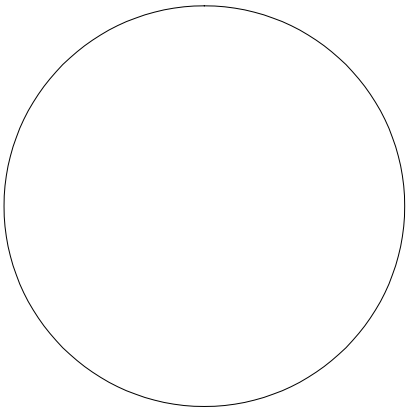
1. 37.7 cm^3
2. 7065 cm^3
3. 33.5 cm^3
4. 541.6 cm^3
5. a. P = 16 cm, A = 15 cm^2 b. P = 14.9 cm, A = 7.7 cm^2 c. P = 16.3 cm, A = 21.2 cm^2

Source: Government of BC used with permission.

PERIMETER, AREA & VOLUME 3

1. Find the perimeter (P) and area (A) of each figure. Measure in centimetres.

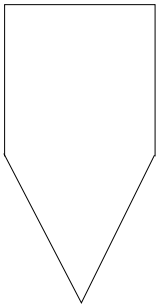
a.



a. P = _____

A = _____

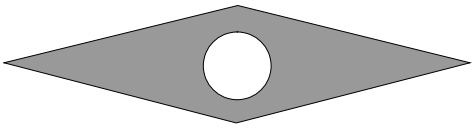
b.



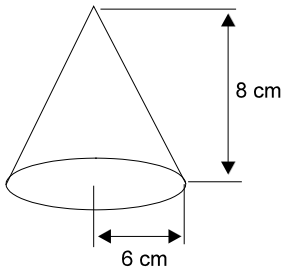
b. P = _____

A = _____

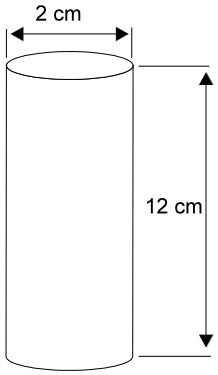
2. Find the area of the shaded figure. _____



3. Find the volume (V) of the cone in cm^3. _____

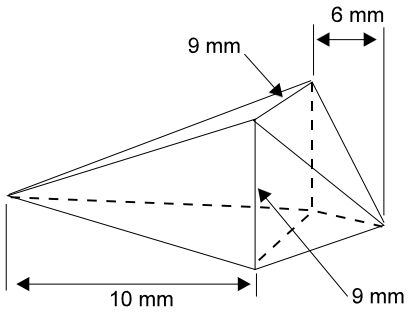


4. Find the volume of the cylinder. _____



5. Find the volume of a sphere with a diameter of 8 cm. _____

6. Find the volume of the solid.



ANSWER KEY

(Answers may vary due to printing of diagrams)

1. a. P = 16.3 cm, A = 21.2 cm^2 b. P = 10.6 cm, A = 6 cm^2
2. 4.1 cm^2
3. 301.4 cm^3
4. 37.7 cm^3
5. 267.9 cm^3
6. 432 mm^3

Source: Government of BC used with permission.

Ratio & Proportion

RATIO & PROPORTION 1

1. Write as ratios:

   a. 6 nickels to 25 quarters _____

   b. 3 hits out of 8 times at bat _____

2. Reduce these ratios to lowest terms:

   a. $\frac{13}{52}$ _____

   b. 9:12:6 _____

   c. 85:17 _____

3. State whether the following form proportions:

   a. 3:4 and 16:24 _____

   b. $\frac{55}{11}$ and $\frac{13}{26}$ _____

4. Find the value of the variable in the following proportions:

a. 7:13 = x:52 _____

b. c:4 = 16:2 _____

c. $\frac{15.5}{d} = \frac{12}{576}$ _____

d. 7:15 = x:45 _____

e. $\frac{9}{21} = \frac{d}{7}$ _____

5. A friend has asked you to make a punch for a party. Your recipe used 2 cans of pineapple juice to 3 cans of orange juice to 4 cans of soda. You need to increase the recipe 2 ½ times. How many cans of pineapple juice, orange juice and soda do you need?

_____

ANSWER KEY

1. a. 6:125 b. 3:8

2. a. ¼ b. 3:4:2 c. 5:1

3. a. no b. no

4. a. 28 b. 32 c. 744 d. 21 e. 3

5. 5 cans pineapple juice, 7.5 cans orange juice, 10 cans soda

Source: Government of BC used with permission.

RATIO & PROPORTION 2

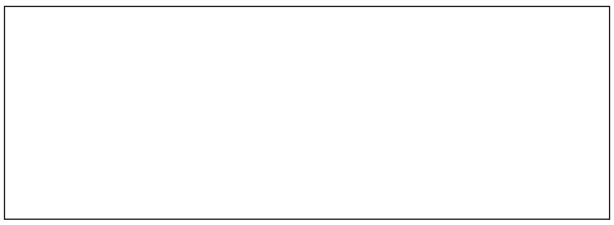
1. If you can eat 5 hot dogs in 3 minutes, how long would it take for 60 hot dogs to be eaten?

_____

2. A student skate-boarded 242 km in 16 days. At this rate, how far would the student travel in 24 days?

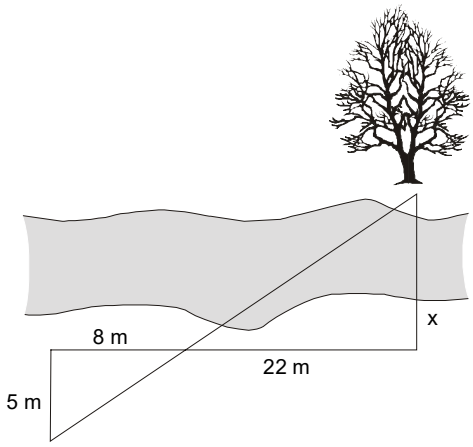
_____

3. The following is a scale diagram for a backyard. Mario wants to know the length and width of the yard so that he can build a fence. (the scale is 1:375)



4. A painter wants to determine how high a building is. He knows the building's shadow is 28 m. The painter's height is 1.8 m and his shadow's length is 2.4 m. Using similar triangles, find the building's height.

5. Find the distance, x, across the creek.



ANSWER KEY

1. 36 minutes
2. 363 km
3. length = 3000 cm or 30 m, width = 1125 cm or 11.25 m
4. 21 m
5. 13.75 m

Source: Government of BC used with permission.

RATIO & PROPORTION 3

1. Write as ratios:

   a. 35 days to 6 weeks _____

   b. 5 mm to 7 mm _____

2. Reduce these ratios to lowest terms:

   a. $\frac{82}{98}$ _____

   b. 8:24:72 _____

   c. 72:36 _____

3. State whether the following form proportions:

   a. 7:8 and 17:19 _____

   b. $\frac{8.5}{17}$ and $\frac{3}{6}$ _____

4. Find the value of the variable in the following proportions:

a. 7:8 = x:112 _____

b. $\frac{5}{c} = \frac{22.5}{18}$ _____

c. $\frac{2}{5} = \frac{12}{d}$ _____

d. 3.1:9.3 = 4.2=d _____

e. 6:8 = 48:y _____

5. In a recipe, the ratio of milk to flour is 5 to 12. If 3 cups of milk are needed, how many cups of flour are also used?

_____

ANSWER KEY

1. a. $\frac{35}{42}$ b. $\frac{5}{7}$

2. a. $\frac{41}{49}$ b. 1:3:9 c. 2:1

3. a. no b. yes

4. a. 98 b. 4 c. 30 d. 12.6 e. 64

5. 7.2 cups of flour

Source: Government of BC used with permission.

RATIO & PROPORTION 4

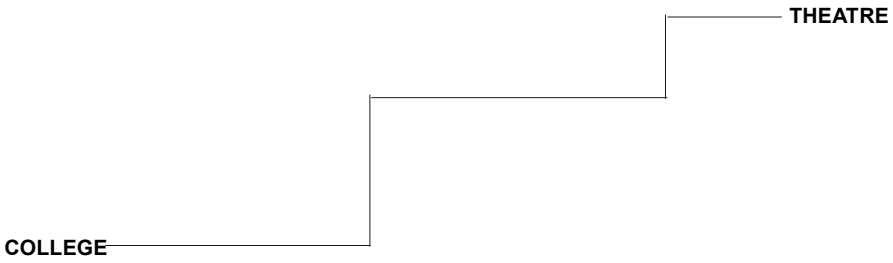
1. A student biked 270 km in 15 days. At this rate, how far would the student travel in 25 days?

_____

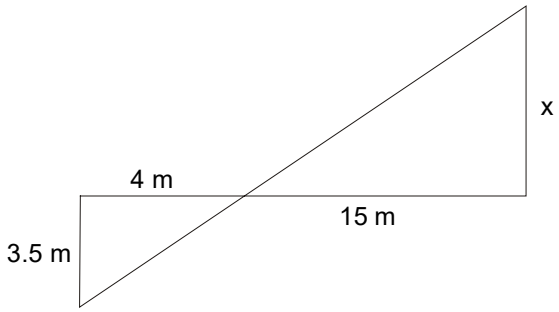
2. In a package of 144 LED mini-lights, there were 6 “duds”. How many “duds” would you find in a package of 360?

_____

3. The following diagram gives directions on how to get from the college to the theatre. The scale of the map is 1 cm:2 km. How far do you have to travel to get to the theatre from the college?



4. Find the distance, x, across the parking lot to the beach.



5. If a 2.0 m person casts a shadow of 3.0 m and a tree casts a shadow of 45 m, how tall is the tree?

ANSWER KEY

1. 450 km
2. 15 “duds”
3. 24.2 km
4. x = 13.125 m
5. 30 m

Source: Government of BC used with permission.

Percent

Source: Government of BC used with permission.

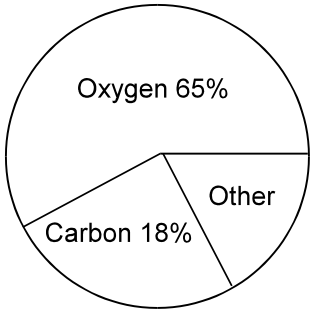
PERCENT 1

1. 18% of Alberta's paycheque is deducted for income tax and 6.3% goes for other deductions. What percent of her paycheque does Alberta home?

2. Study the circle graph.

   a. What percent of the human body is made up of oxygen and carbon?

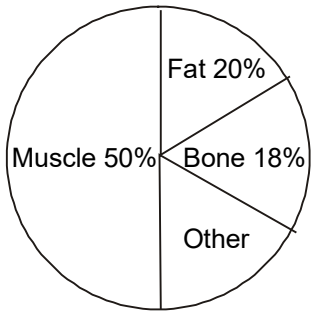
   b. What percent is the other?



3. Study the circle graph.

   a. What percent is the other?

   b. Which two materials make up most of the body? How much?



4. By the end of the semester, 12 out of 40 students had withdrawn from a particular course. What percent was this?

5. There were 80 questions on a test. One student had 74 questions correct. What percent were correct? What percent were incorrect?

6. A common guide is that you should try to save 10% of your income. Don followed this advice and last month he saved $186. What was his income for the month?

7. Water consists of 3 parts hydrogen and 16 parts oxygen. What percent of water is oxygen? (Hint: to find the total, add the parts.) Round your answer to one decimal place.

8. Carbon dioxide consists of 12 parts carbon to 32 parts oxygen. What percent of carbon dioxide is carbon? Round your answer to one decimal place.

9. 63 students completed the task and 22 did not. What percent of the students did complete the task? Round your answer to a whole percent.

10. About 60% of blood is a liquid called plasma which is mainly water. The average adult has about 6 litres of blood. How much water is in the average adult's blood?

ANSWER KEY

1. 75.7%

2. a. 83% b. 17%

3. a. 12% b. muscle and fat (70%)

4. 30%

5. 92.5%, 7.5%

6. $1,860

7. 84.2%

8. 27.3%

9. 74%

10. 3.6L

Source: Government of BC used with permission.

PERCENT 2

1. Alexa bought a new car for $6,750. She paid 20% down. If the balance is to be paid in 24 equal installments, how much will she pay each month? Hint: there are two steps to this problem.

2. If a grocer marks up his produce by 10%, what will be the price on each of the following? Round your answer to the nearest cent.

   a. lettuce $0.45/head

   b. oranges $1.60/dozen

   c. tomatoes $3.28/kg

   d. carrots $1.43/kg

   e. onions $0.66/kg

3. What is the percent reduction on a laptop if its regular price is $800 and the sale price is $560? Remember that the reduction is expressed as a percent of the regular price.

4. Which is a better discount, a stereo reduced from $650 to $500 or one reduced from $750 to $560?

5. A politician said he would take a 5% wage cut. His new salary, without benefits, is $65,000 per year. Determine what his previous salary was.

6. What is the regular price of work gloves if the discount is 20% and the sale price is $32?

7. The price of a colour television set was reduced from $450 to $424.99. What was the percent decrease in price?

8. A province charges a sales tax of 7%. What is the sales tax on a purchase of $320?

9. An item has a marked price of $425. It is placed on sale at 15% off. What is the discount and what is the sale price?

10. The combined sales tax in a province is 14%. If Pat was considering purchasing a tool set advertised at $425, how much tax would be charged? What is the total cost of the tool set?

ANSWER KEY

1. $225/month

2. lettuce $0.50/head, oranges $1.76/dozen, tomatoes $3.61/kg, carrots $1.57/kg, onions $0.73/kg

3. ($800 - $560) ÷ $800 = 30% reduction

4. ($650 - $500) ÷ $650 = 23% reduction
   ($750 - $560) ÷ $750 = 25% reduction - better buy

5. x = $68,421.05 (previous salary)

6. x = $40 (regular price of the dress)

7. Percent decrease 5.6%

8. Sales tax is $22.40

9. discount is $63.75, sales price $361.25

10. $59.50, $484.50

Source: Government of BC used with permission.

PERCENT 3

1. Convert to a decimal:

   a. 75% b. 37 ½ %

2. Convert to a fraction:

   a. 150% b. 3 ¼ %

3. Convert to percentage:

   a. 0.15 b. 0.002 c. ¾ d. 2/3 e. 2 ½

4. Solve the following.

   a. What percent of 85 is 17?

   b. 75 is 300% of what number?

   c. Find 12% of 12.

5. Dimitri got 39 out of 65 on the math test. What is the percent?

6. 62% of the 12,000 citizens voted for Kim. How many votes did Kim receive?

7. An 800 gram water sample contained 0.02% iron. How many grams of iron are in the water?

8. Only 17 of the 102 respondents answered the metric question correctly. What percent did not get the question correct?

9. Seven percent of light bulbs produced at The Light House are known to be defective. If 140 defective light bulbs were found last Tuesday, how many light bulbs were produced?

10. Enrollment in Adult Basic Education classes in September 2018 was 712 students. In September 2017, the enrollment was 656. What is the percentage increase?

11. A television originally priced at $799 has been marked down to $549. What is the percent decrease?

12. Find the simple interest on a credit card bill of $960 at 16% for 60 days.

13. Find the simple interest on $2,100 invested at 4% interest for ½ a year.

14. A purchase of $44 has additional sales tax of $2.31. What is the sales tax rate?

ANSWER KEY

1. a. 0.75 b. 0.375

2. a. 3/2 OR 1 ½ b. 13/400

3. a. 15% b. 0.2% c. 75% d. 66 2/3% or $66.\overline{6}\%$ e. 250%

4. a. 20% b. 25 c. 1.44

5. 60%

6. 7,440 votes

7. 0.16 grams

8. 16.7%

9. 2,000 bulbs

10. 8.5%

11. 68.7%

12. $25.25

13. $42

14. 5.25%

Source: Government of BC used with permission.

PERCENT 4

1. Convert to a decimal:

   a. 5%

   b. 29.3%

2. Convert to a fraction:

   a. 37 ½ %

   b. 102%

3. Convert to a percent:

   a. 3.67

   b. 0.725

   c. $\frac{1}{5}$

   d. $\frac{7}{8}$

   e. $1\frac{2}{3}$

4. Solve the following.

   a. 9 is what percent of 27?

   b. Find 25% of 200.

   c. 15 is 25% of what number?

5. Bianca got 68 out of 85 on the math test. What is the percent?

6. 58% of the 15,000 citizens voted for Mario. How many votes did Mario receive?

7. A 600-gram water sample contained 0.05% iron. How many grams of iron are in the water?

8. Only 9 of the 135 respondents answered the metric question correctly. What percent did not get the question correct?

9. A package of hamburger is 70% lean meat. The rest is fat. How much fat is there in a 2 kg package of hamburger?

10. Sodium chloride is 40% sodium and 60% chlorine. A 200 gram sample of sodium would be found in sodium chloride weighing how many grams?

11. It is estimated that 21.2% of all workers use a computer in their jobs. If 2 million workers use computers, how many workers are there in total?

12. Find the simple interest on a credit card bill of $1,250 at 22% for 30 days.

13. Find the simple interest on $1,000 invested at 6 ¾ % interest for 1 year.

14. A pair of jeans that regularly costs $38 is on sale at 40% off. What is the sale price?

ANSWER KEY

1. a. 0.05 b. 0.293

2. a. $\frac{3}{8}$ b. $\frac{51}{50}$ or $1\frac{1}{50}$

3. a. 367% b. 72.5% c. 20% d. 87.5% e. $166\frac{2}{3}\%$ or $166.\overline{6}\%$

4. a. $33\frac{1}{3}$ or $33.\overline{3}\%$ b. 50 c. 60

5. 80%

6. 8,700 votes

7. 0.3 grams

8. 6.7%

9. 0.6 kg

10. 500 grams

11. 9.4 million

12. $22.60

13. $67.50

14. $22.80

Source: Government of BC used with permission.

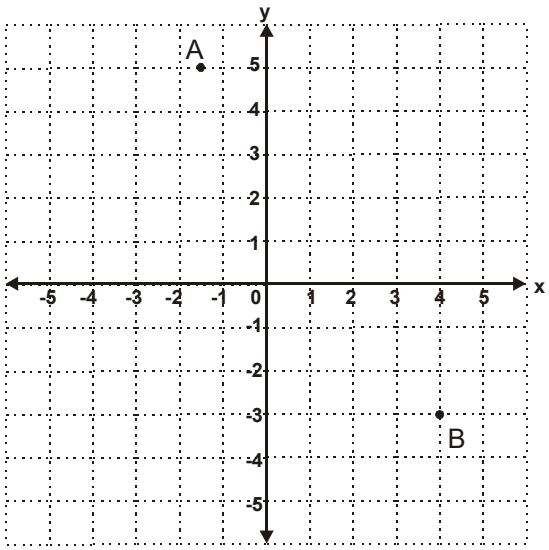
Graphing

Source: Government of BC used with permission.

GRAPHING 1

1. Is (-1,5) a solution to y = 2x + 3? _____

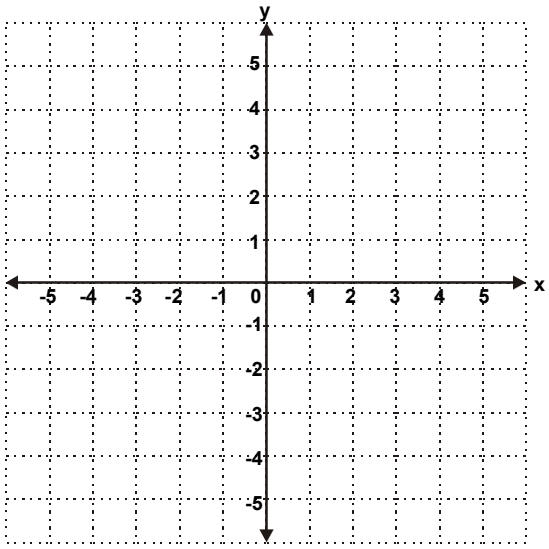
2. Complete the following:



a. Name point A and point B.

A _____

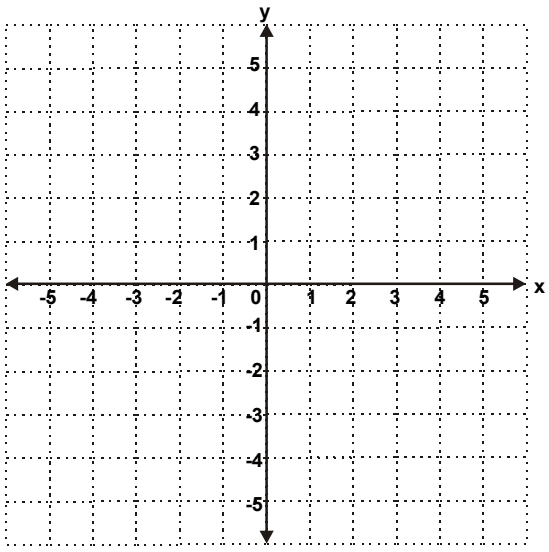
B _____



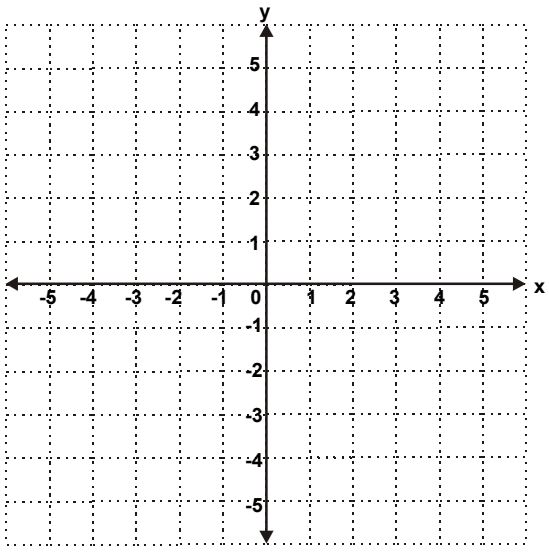
b. Plot the points (-2,5) and (0,-3).

3. Graph each linear equation.

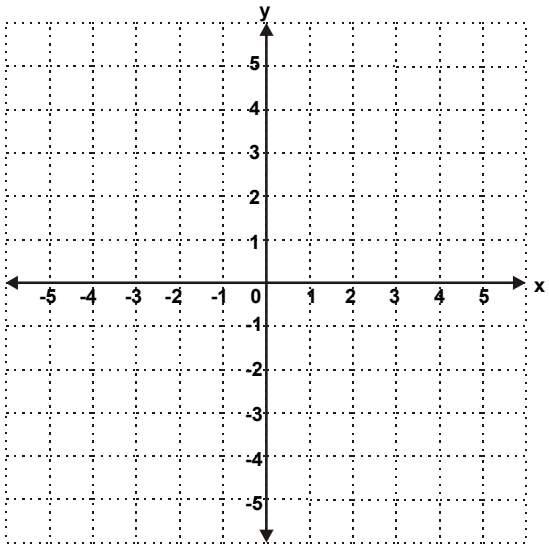
a. $y = x - 4$



b. $y = -2x + 3$



c. $y = 5 - x$

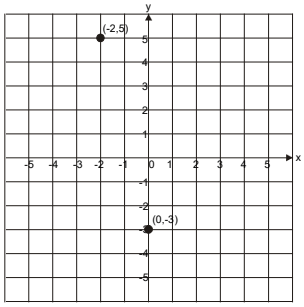


ANSWER KEY

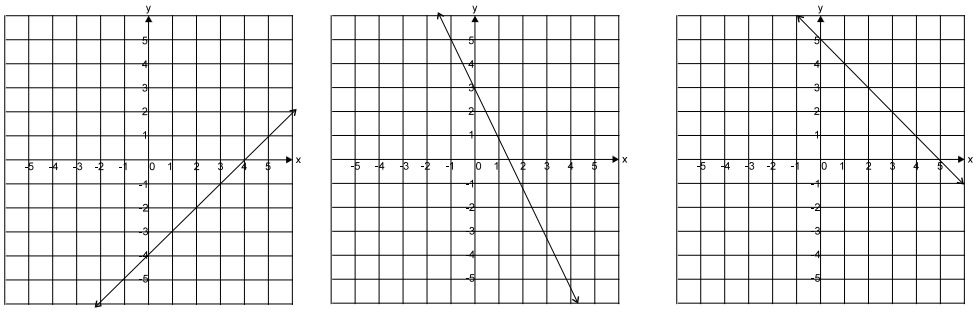
1. yes

2. a. A (-1.5,5) B (4,-3)

b.



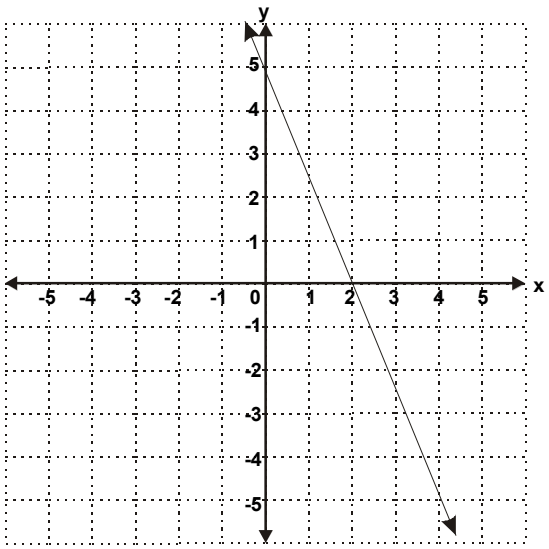
3. a. b. c.



Source: Government of BC used with permission.

GRAPHING 2

1. Given the graph of the line, determine the following:



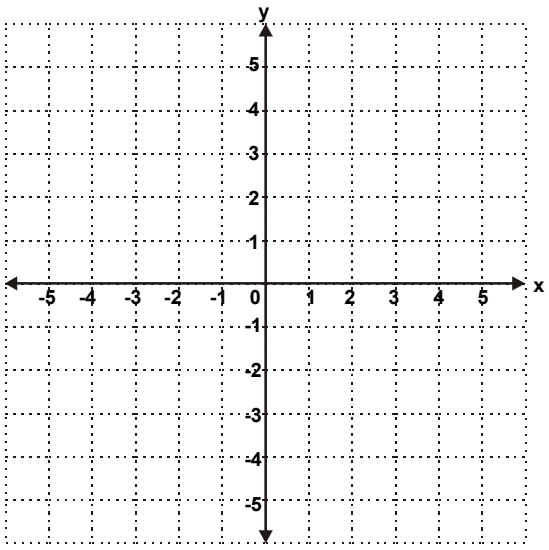
a. x-intercept _____

b. y-intercept _____

c. slope _____

d. equation _____

2. Given the equation y = 3x - 3, determine the following:



a. x-intercept _____

b. y-intercept _____

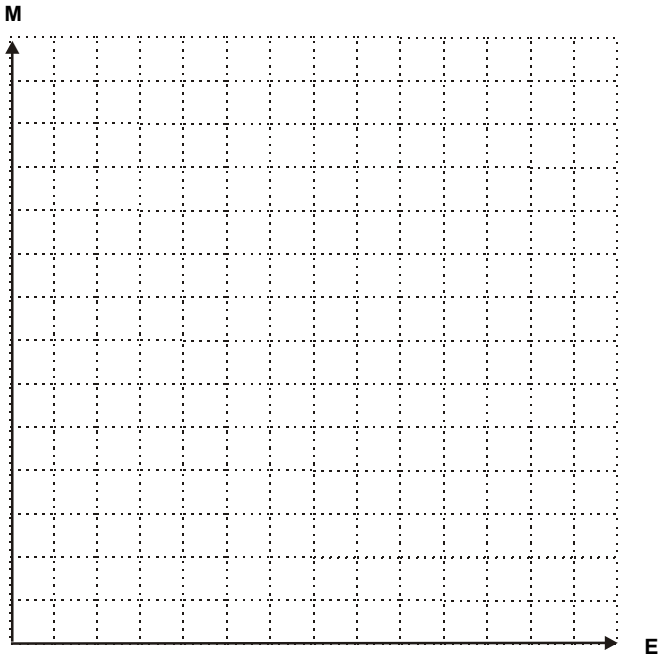
c. slope _____

d. graph _____

3. The weight of an object on earth, E, and its corresponding weight on the moon, M is given by the formula $M = \frac{1}{6}E$.

a. Complete the table of values and graph $M = \frac{1}{6}E$.

E	M



b. How much would a 120-pound woman weigh on the moon?

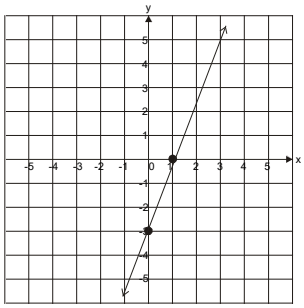
c. How much would a 40-pound moon rock weigh on Earth?

ANSWER KEY

1. a. (2,0) b. (0,5) c. -5/2 d. y = -5/2x + 5

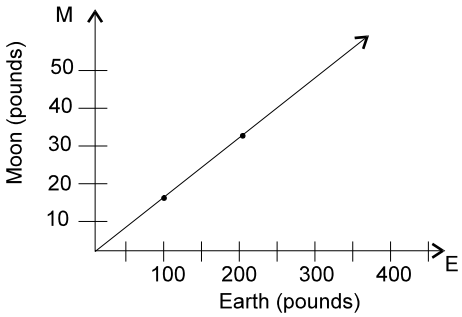
2. a. (1,0) b. (0,-3) c. 3

d.



3. a.

E	M
0	0
100	16.7
200	33.3



b. 20 pounds

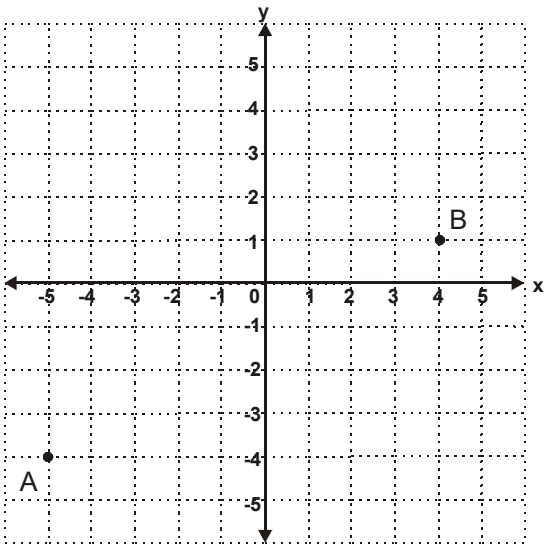
c. 240 pounds

Source: Government of BC used with permission.

GRAPHING 3

1. Is (-1,9) a solution to y = 6x - 3? _____

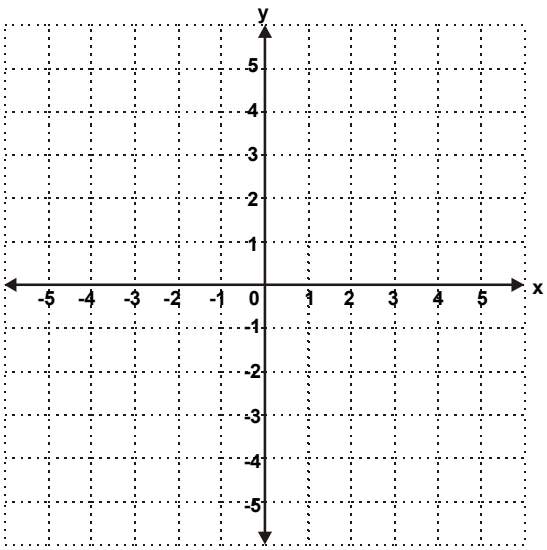
2. Complete the following



a. Name points A and B.

A _____

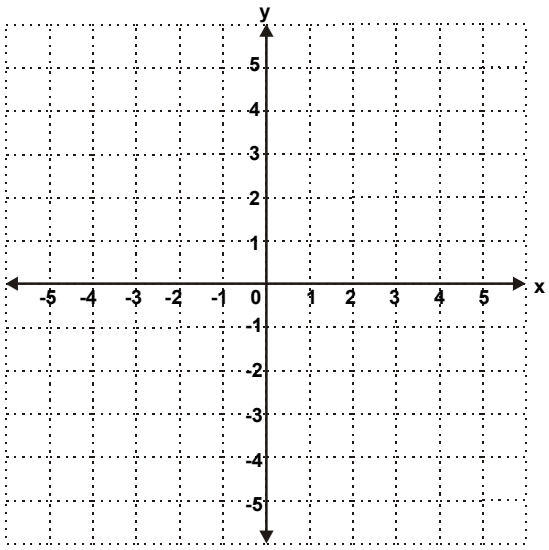
B _____



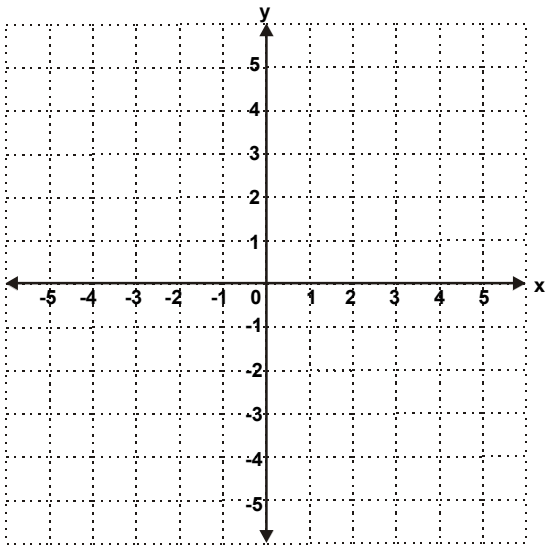
b. Plot the points (3,-1) and (-4,0)

3. Graph each linear equation.

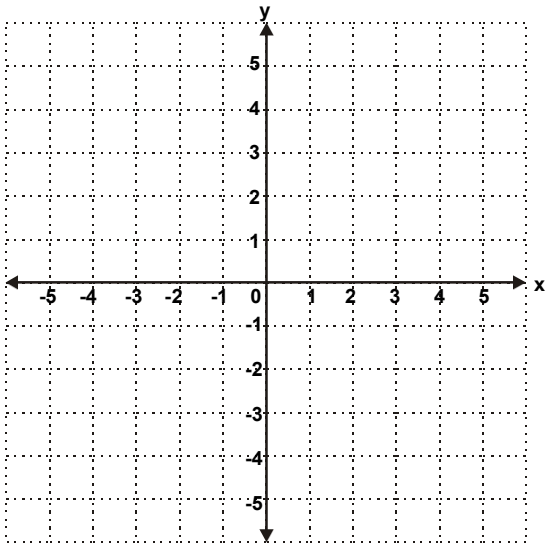
a. $y = x - 3$



b. $y = -2x - 1$



c. $y = 4 - x$

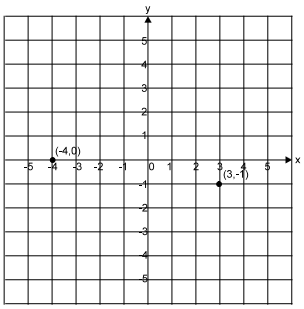


ANSWER KEY

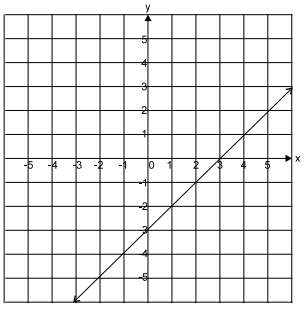
1. no

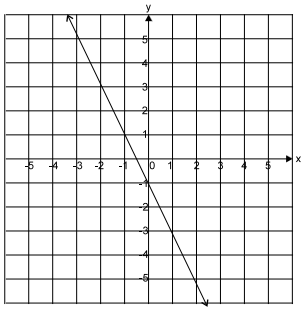
2. a. A (-5,-4) B (4,1)

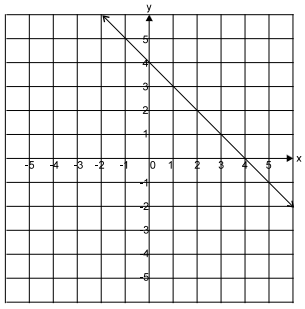
   b.



3. a. b. c.







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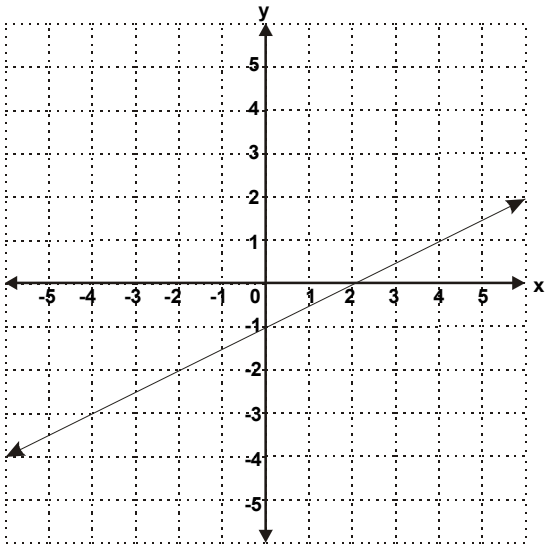
GRAPHING 4

1. Given the graph of the line, determine the following:



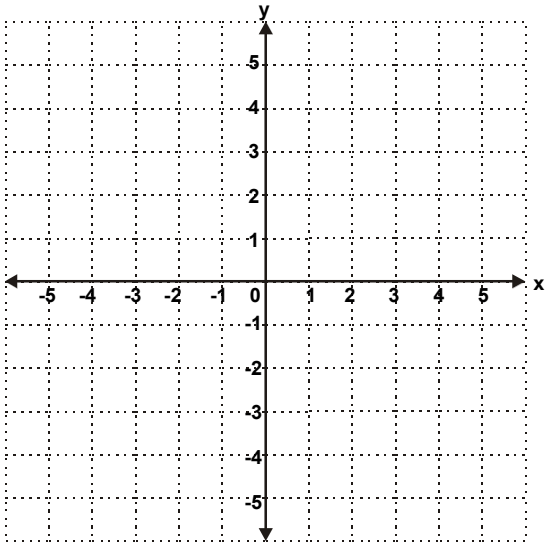
a. x-intercept _____

b. y-intercept _____

c. slope _____

d. equation _____

2. Given the equation y = 3 - 1.5x, determine the following:



a. x-intercept _____

b. y-intercept _____

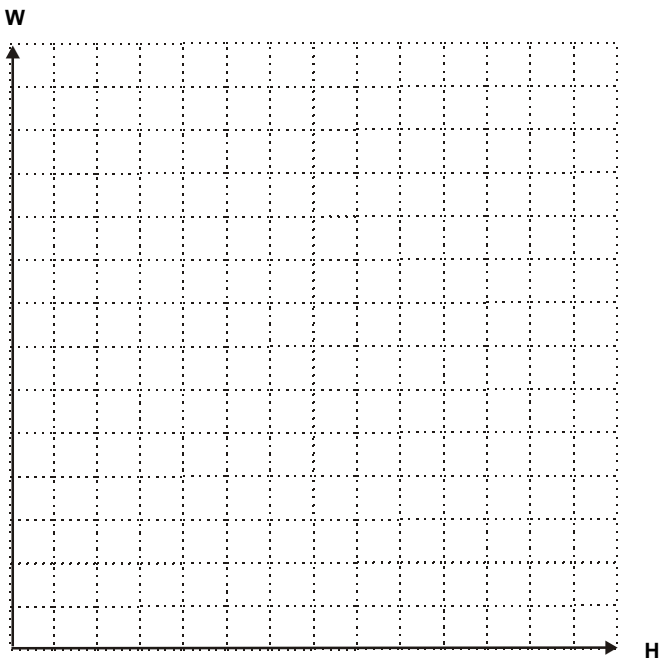
c. slope _____

d. graph _____

3. The mass of water, W, contained in a human body of mass H is given by the formula W = 0.72H.

a. Complete the table of values and graph W = 0.72H.

H	W



b. How much water would a 25-kg child contain?

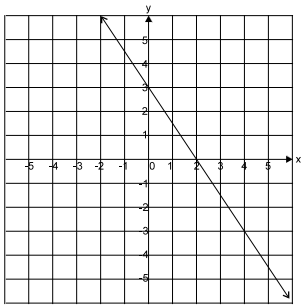
c. If a person contained 50 kg of water, what would their mass be?

ANSWER KEY

1. a. (2,0) b. (0,-1) c. 1/2 d. y = 1/2x -1

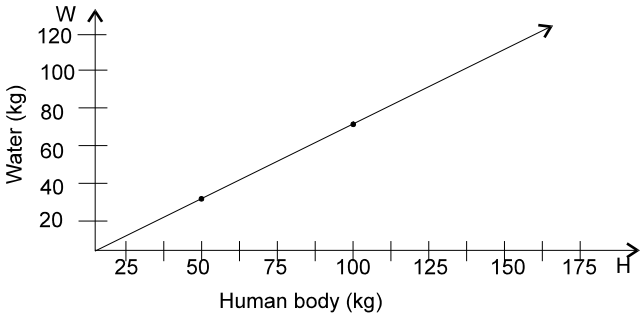
2. a. (2,0) b. (0,3) c. -1.5

d.



3. a.

E	M
0	0
50	36
100	72



b. 18 kg

c. 69 kg

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