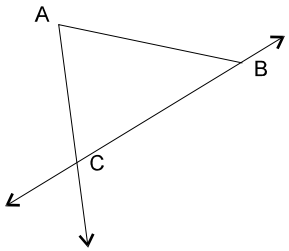
Geometry

GEOMETRY 1: LINES, RAYS, SEGMENTS & ANGLES

1. From the drawing:



a. name three different line segments

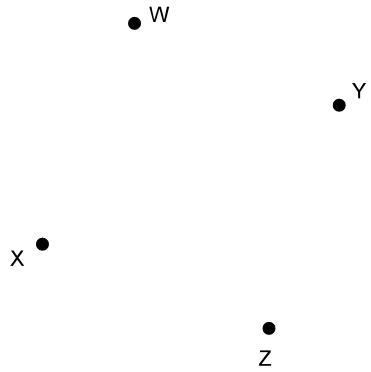
b. name the line

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. $\overline{WY}$

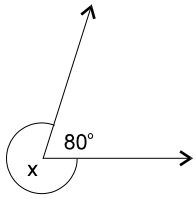
b. $\overleftrightarrow{XY}$

c. $\overrightarrow{WX}$

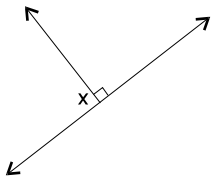
d. line m which contains Z so that m $||$ $\overleftrightarrow{XY}$

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

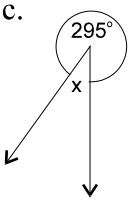
a.



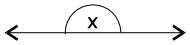
b.



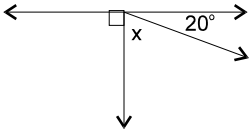
c.



d.

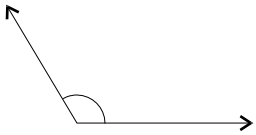


e.

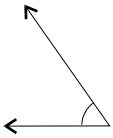


4. With a protractor, measure the angle indicated by the curve.

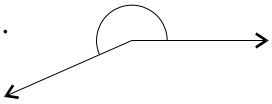
a.



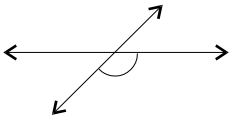
b.



c.



d.



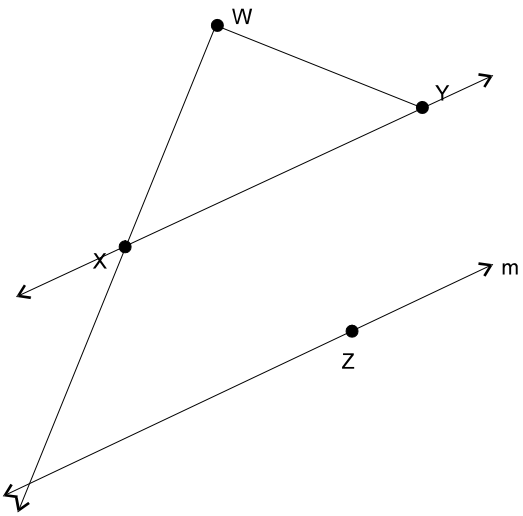
ANSWER KEY

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.

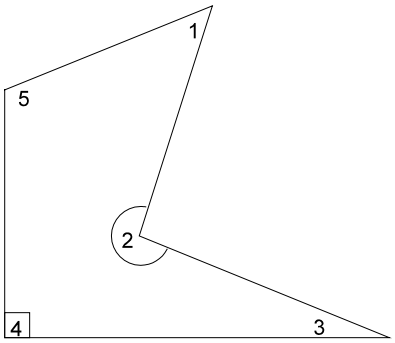
a. $\angle ABC = 40°$

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

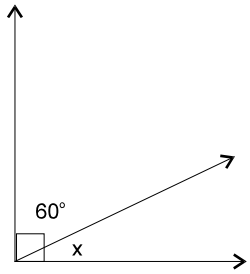
$\angle 3$ is

$\angle 4$ is

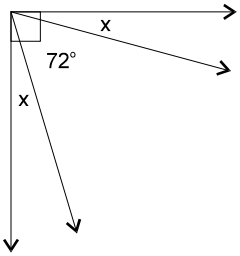
$\angle 5$ is

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

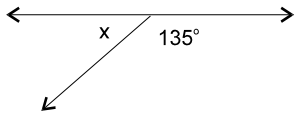
a.



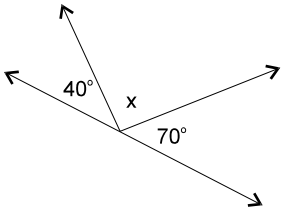
b.



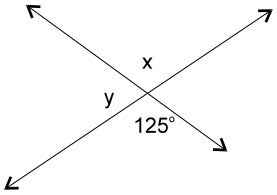
c.



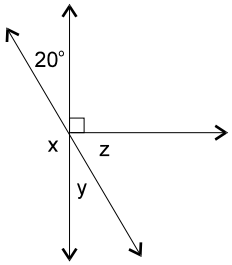
d.



e.



f.



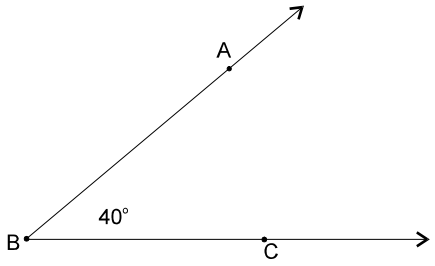
4. a. ∠A and ∠B are vertically opposite and ∠B = 132°. ∠A = ____

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

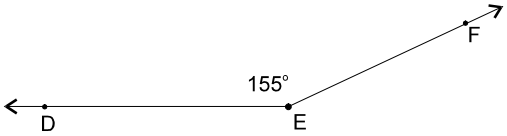
c. ∠E and ∠F are congruent and supplementary. ∠E = _____ ∠F = _____

ANSWER KEY

1. a.

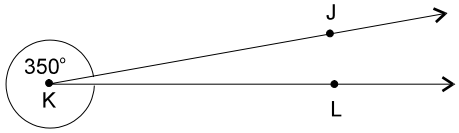


b.



c.

d.



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

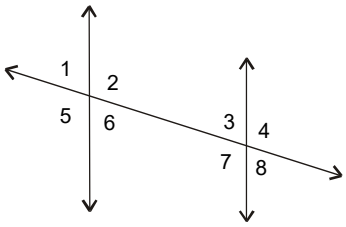
3. a. x = 30° b. x = 9° c. x = 45° d. x = 70° e. x = 125°, y = 55°
   f. x = 160°, y = 20°, z = 70°

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:

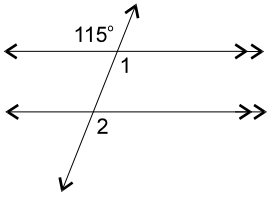


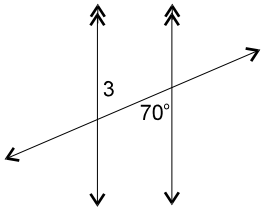
   a. alternate interior angles

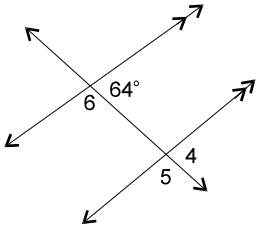
   b. interior angles on the same side of the transversal

   c. corresponding angles

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







∠1 =

∠2 =

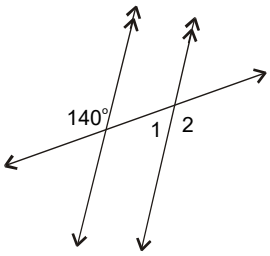
∠3 =

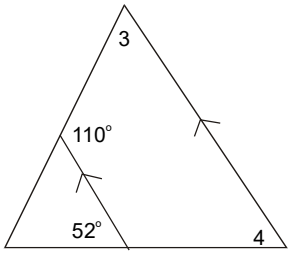
∠4 =

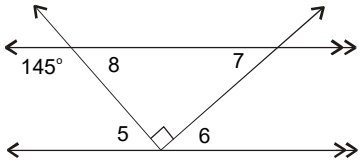
∠5 =

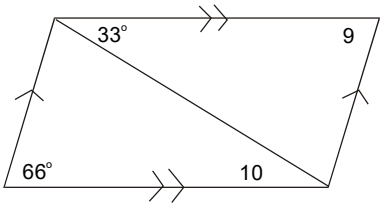
∠6 =

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

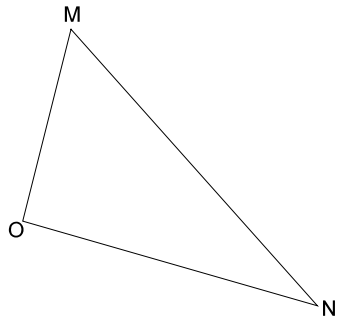
   ∠6 = 116° corr ∠ to ∠5 or supp ∠ to 64°

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:



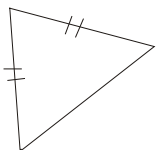
a. the angle opposite $\overline{MO}$

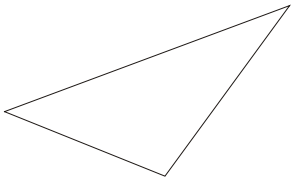
b. the side opposite $\angle MNO$

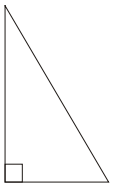
c. the side opposite $\angle O$

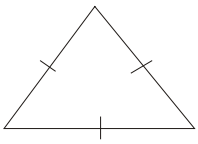
d. the angle opposite $\overline{ON}$

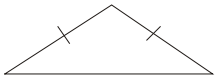
2. Classify the following triangles as either acute, right or obtuse triangles, as well as scalene, isosceles or equilateral triangles.

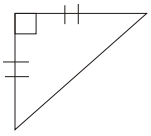
a. 

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 _____.

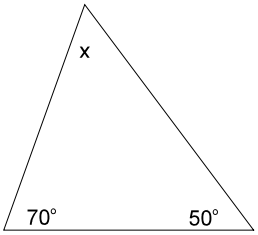
b. An isosceles triangle has _____ congruent sides. The angles opposite these congruent sides are _____.

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

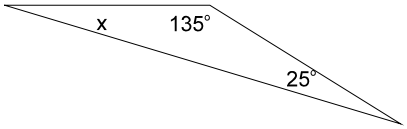
d. If a triangle has two congruent angles, then the sides opposite the congruent angles are _____ _____ .

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

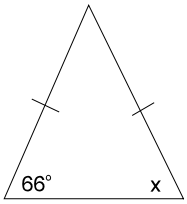
a.



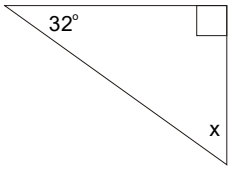
b.



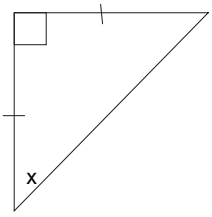
c.



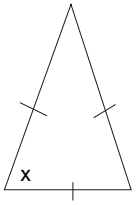
d.



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

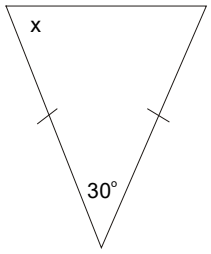
4. a. 60° b. 20° c. 66° d. 58° e. 45° f. 60°

Source: Government of BC used with permission.

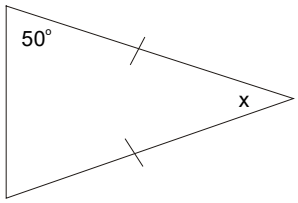
GEOMETRY 5: TRIANGLES

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

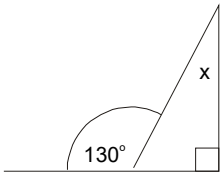
g.



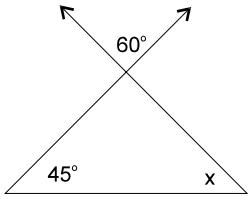
h.



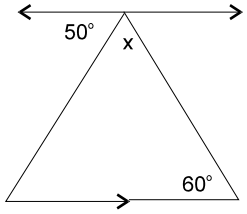
i.



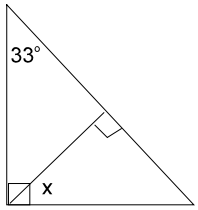
j.



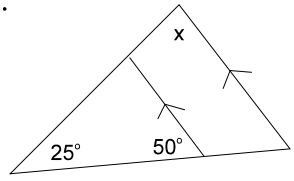
k.



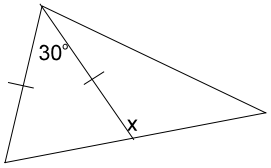
l.



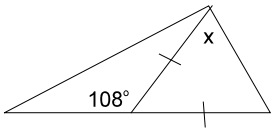
m.



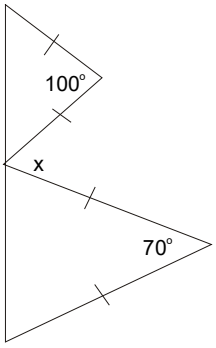
n.



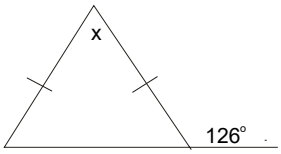
o.



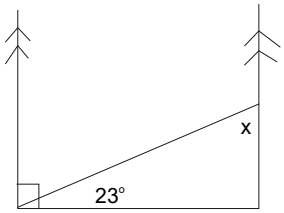
p.



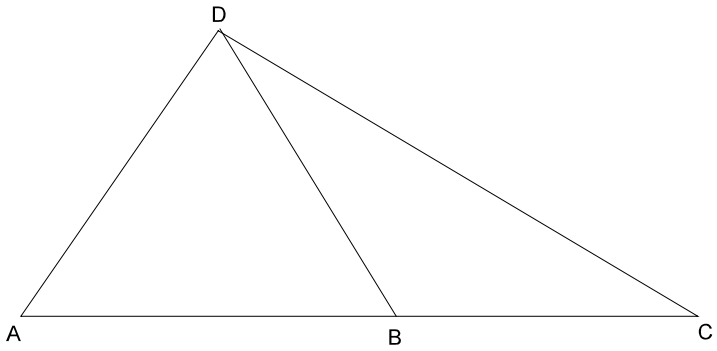
q.



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.

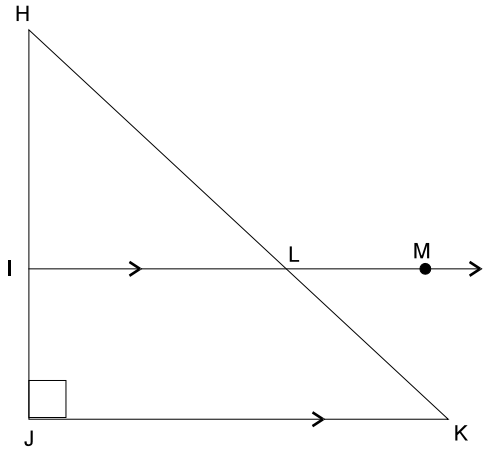
$\angle ABD =$

$\angle CBD =$

$\angle ADB =$

$\angle BDC =$

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

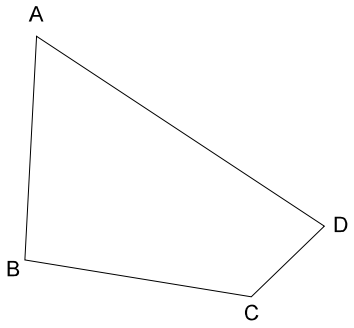
1. g. 75° h. 80° i. 40° j. 75° k. 70° l. 33°
   m. 105° n. 105° o. 54° p. 85° q. 72° r. 67°

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 $\overline{BC}$

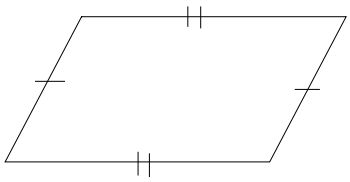
   c. name two angles consecutive to $\angle D$

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

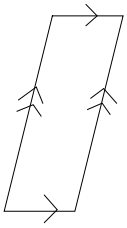
   e. $\angle A + \angle B + \angle C + \angle D =$

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.

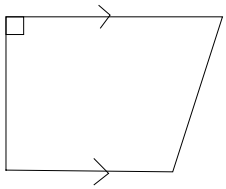
a.



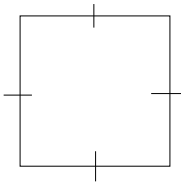
b.



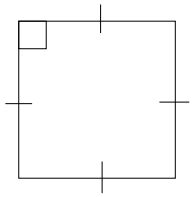
c.



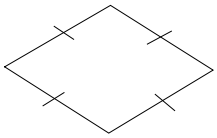
d.



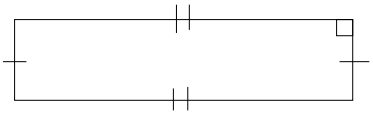
e.



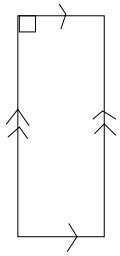
f.



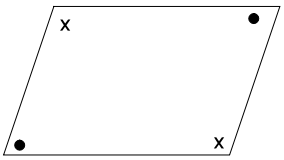
g.



h.

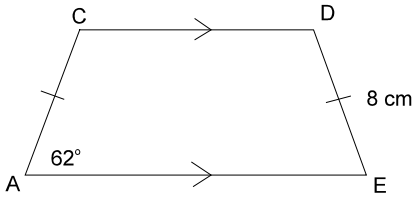


i.



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

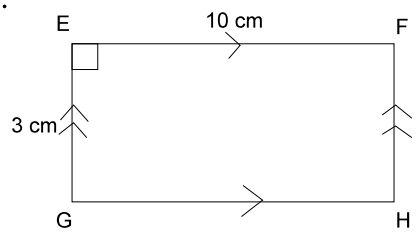
a.



ABCD is a _____ .

∠C = _____ $\overline{AC}$ = _____

b.



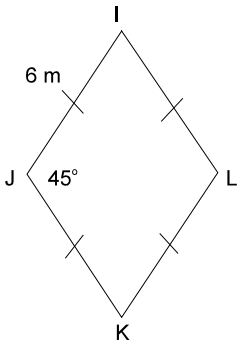
EFGH is a _____ .

∠G = _____ ∠H = _____

∠F = _____

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

c.



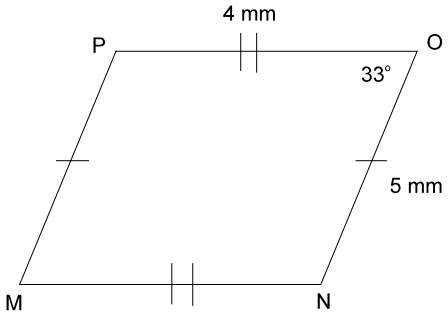
IJKL is a _____

∠I = _____ ∠L = _____

∠K = _____

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

d.

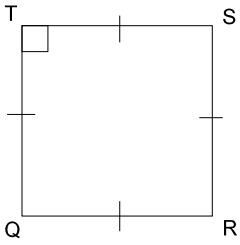


MNOP is a _____

∠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 = _____

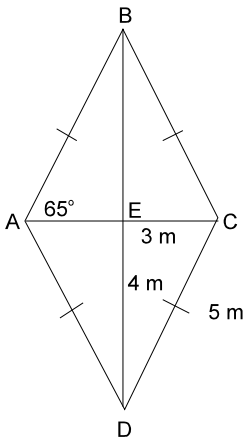
   ∠ABD = _____

   ∠DAE = _____

   $\overline{AE}$ = _____

   $\overline{BE}$ = _____

   $\overline{AD}$ = _____



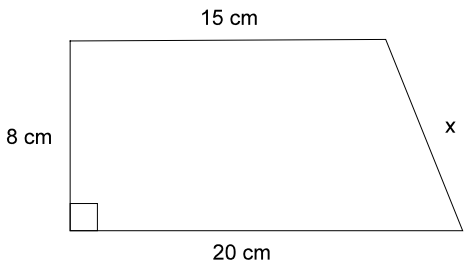
3. One side of a square is 6 m. Find the length of its diagonal. Hint: make a sketch of the square and its diagonal and then use Pythagorean Theorem.

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

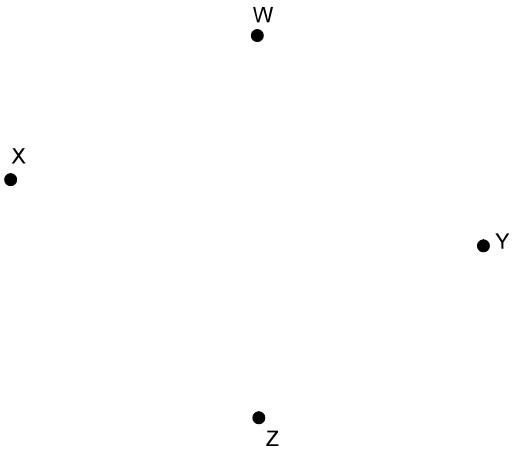
1. Using the points W, X Y and Z, draw the following:

   a. line XY

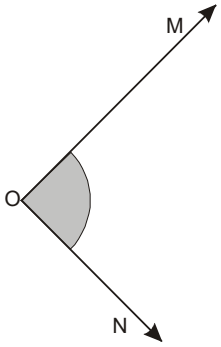
   b. ray YW

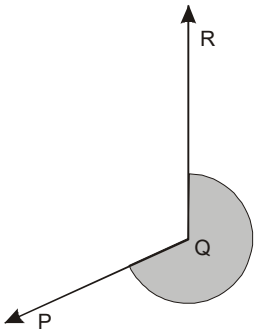
   c. line segment WZ

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

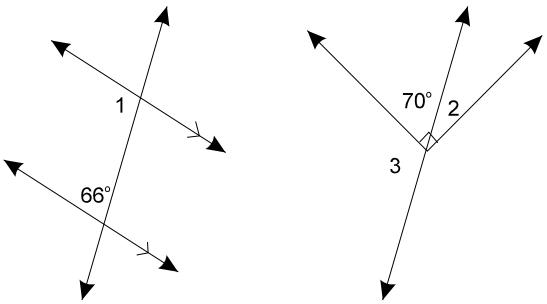


2. Use a protractor to measure angles MON and PQR.





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

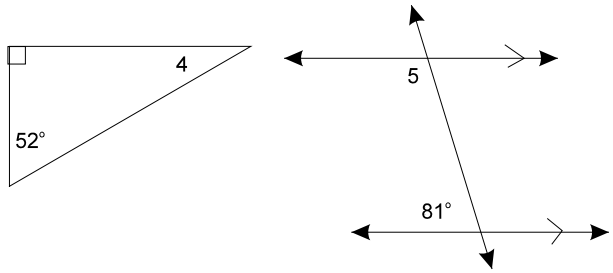


a. ∠1 _____

b. ∠2 _____

c. ∠3 _____

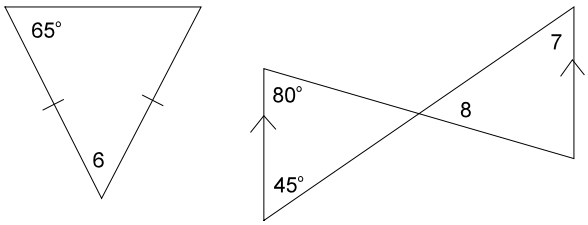
d. ∠4 _____



e. ∠5 _____

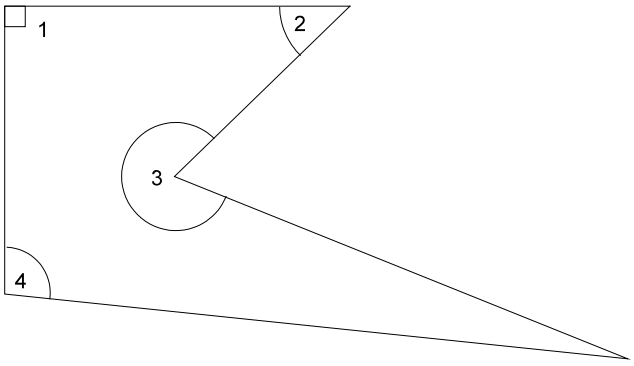
f. ∠6 _____

g. ∠7 _____



h. ∠8 _____

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



a. ∠1 _____

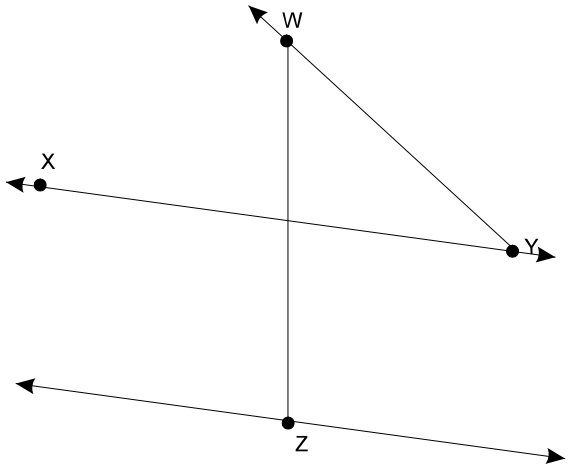
b. ∠2 _____

c. ∠3 _____

d. ∠4 _____

ANSWER KEY

1.



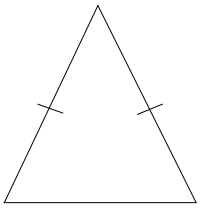
2. ∠MON = 90° ∠PQR = 245°

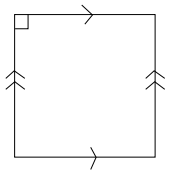
3. a. ∠1 = 114°
   b. ∠2 = 20°
   c. ∠3 = 110°
   d. ∠4 = 38°
   e. ∠5 = 99°
   f. ∠6 = 50°
   g. ∠7 = 45°
   h. ∠8 = 55°

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

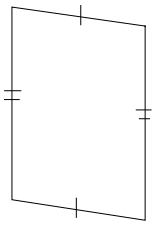
GEOMETRY 9: SUMMARY

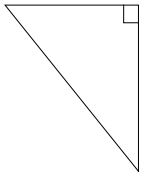
1. Name the type of triangle or quadrilateral shown below.

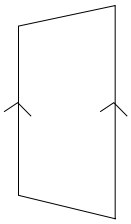
a. 

b. 

c. 

d. 

e. 

f. 

a. _____

b. _____

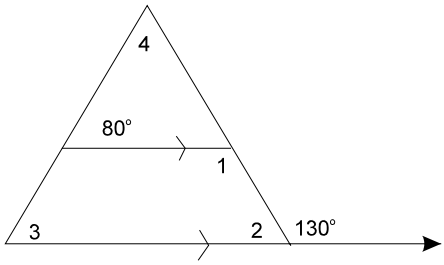
c. _____

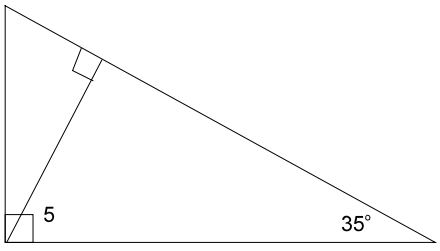
d. _____

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 _____

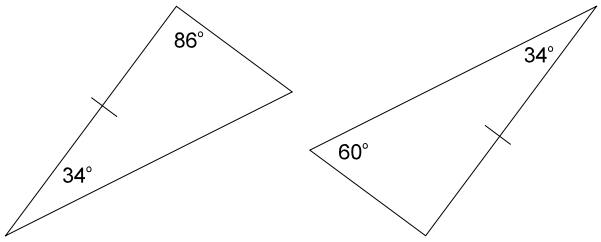
c. ∠3 _____

d. ∠4 _____

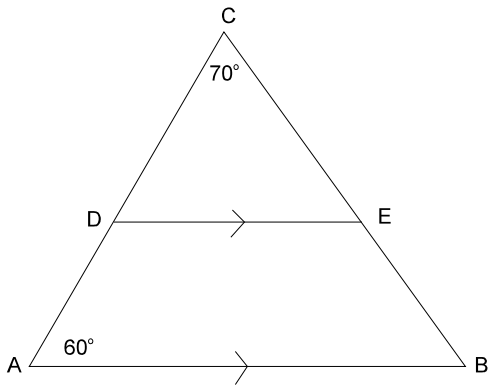
e. ∠5 _____

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?

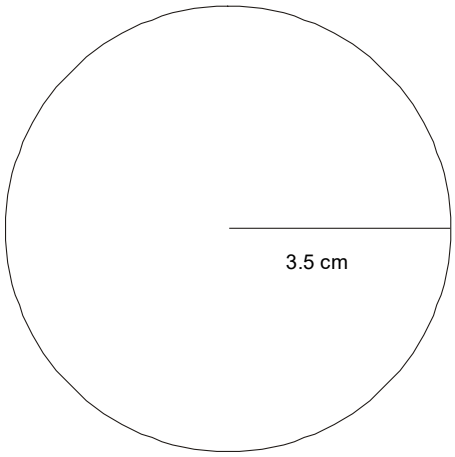


ANSWER KEY

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.



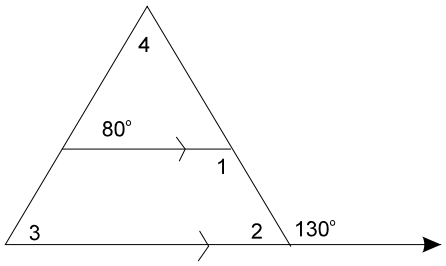
4. yes, SAS

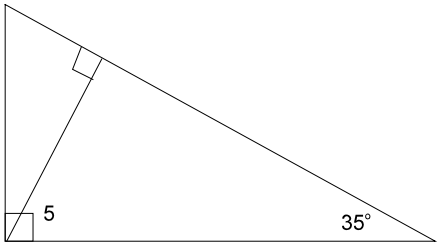
5. No, angles are not the same

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 _____

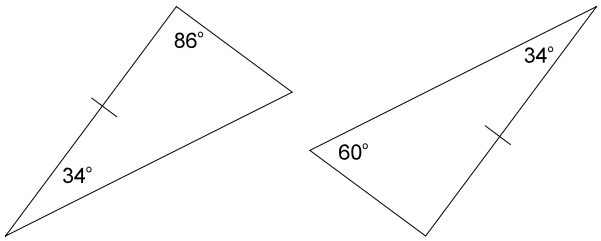
c. ∠3 _____

d. ∠4 _____

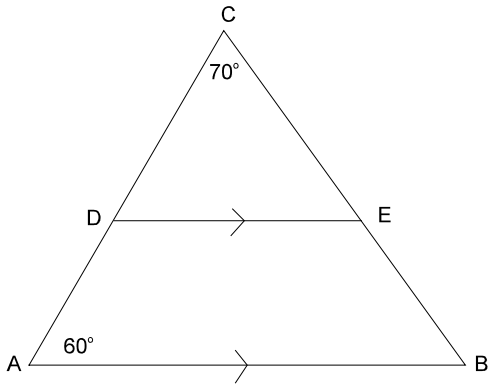
e. ∠5 _____

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°

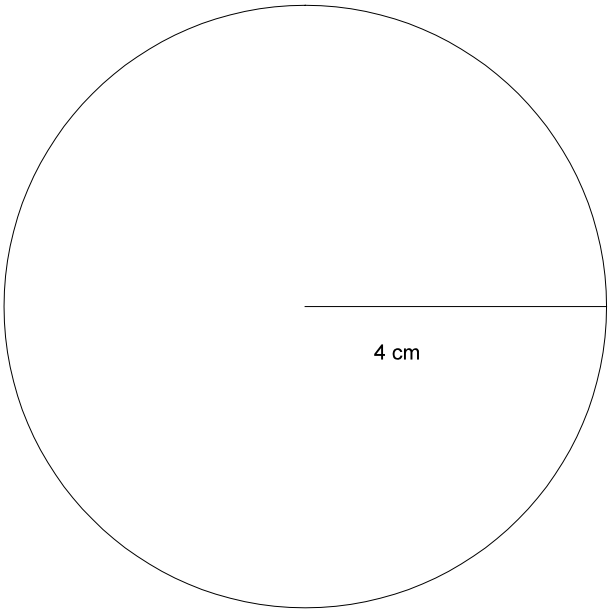
   b. $\angle 2 = 50°$, supplementary to 130°

   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.