



Construction Geometry

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CONSTRUCTION GEOMETRY 1: DRAWING SEGMENTS & ANGLES

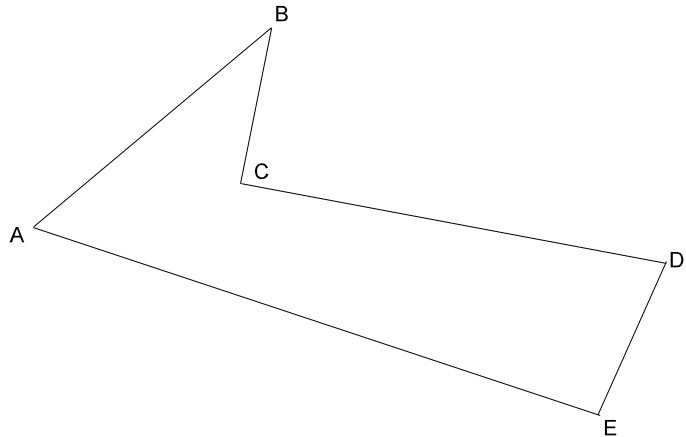
1. Measure the following to the nearest 0.1 cm.

$\overline{AB} =$ _____

$\overline{BC} =$ _____

$\overline{AE} =$ _____

$\overline{CD} =$ _____



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.

$\angle PON =$ _____

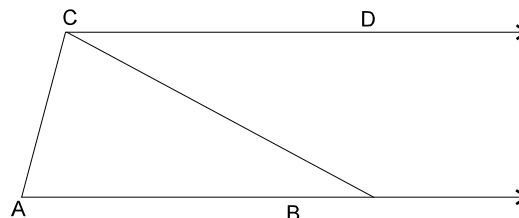
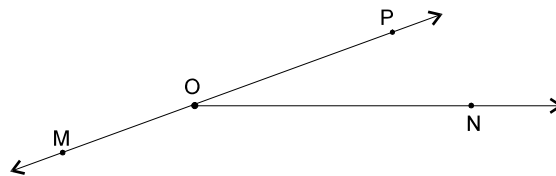
$\angle MON =$ _____

$\angle MOP =$ _____

$\angle BAC =$ _____

reflex $\angle BAC =$ _

$\angle DCA =$ _____



4. Draw and label the following angles.

a. $\angle \text{LAB} = 35^\circ$

b. $\angle \text{BIG} = 6^\circ$

c. $\angle \text{COW} = 145^\circ$

d. $\angle \text{FUN} = 90^\circ$

e. $\angle \text{RAT} = 180^\circ$

f. $\angle \text{DOG} = 315^\circ$

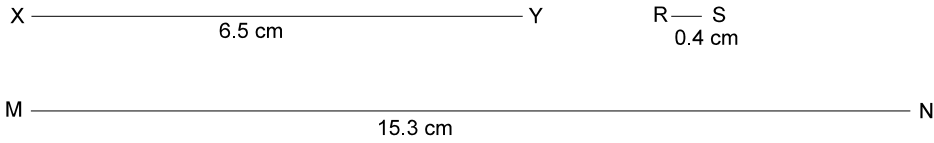
g. $\angle \text{PET} = 205^\circ$

h. $\angle \text{JIM} = 72^\circ$

ANSWER KEY

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

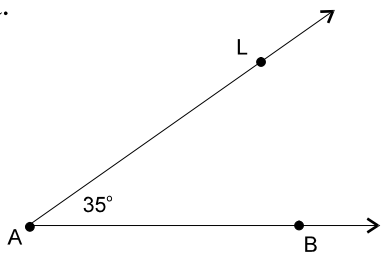
2.



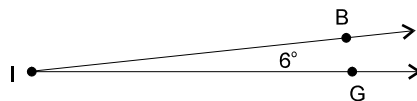
3. $\angle PON = 20^\circ$, $\angle MON = 160^\circ$, $\angle MOP = 180^\circ$, $\angle BAC = 75^\circ$

4.

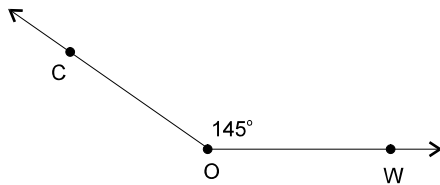
a.



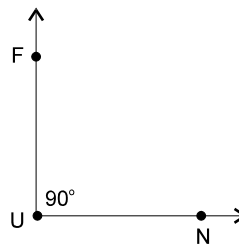
b.



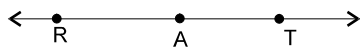
c.



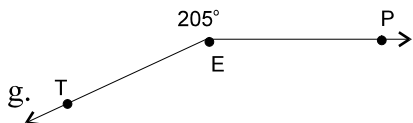
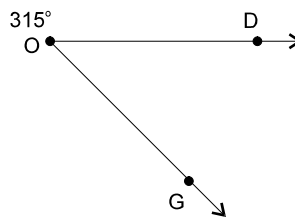
d.



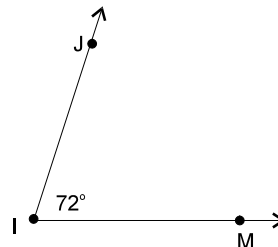
e.



f.



h.



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CONSTRUCTION GEOMETRY 2: DRAWING CIRCLES & SECTORS

1. Draw and label the following circles.

a. radius = 4.5 cm

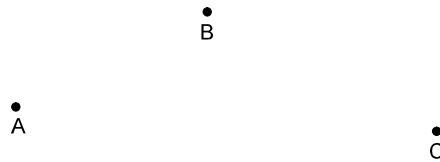
b. diameter = 6 cm

c. radius = 1.8 cm

d. diameter = 7.6 cm

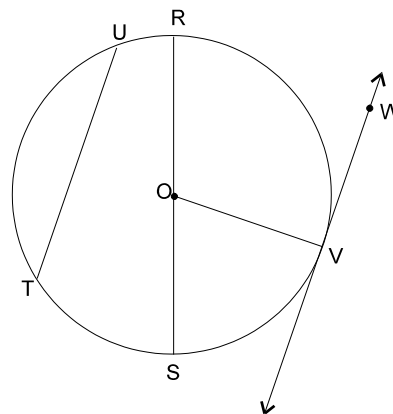
2. Given the points A, B and C, construct the following.

- 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}



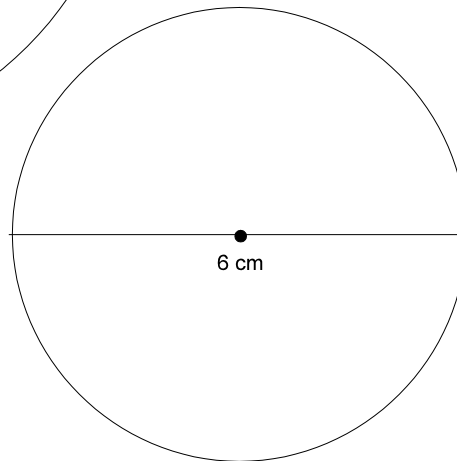
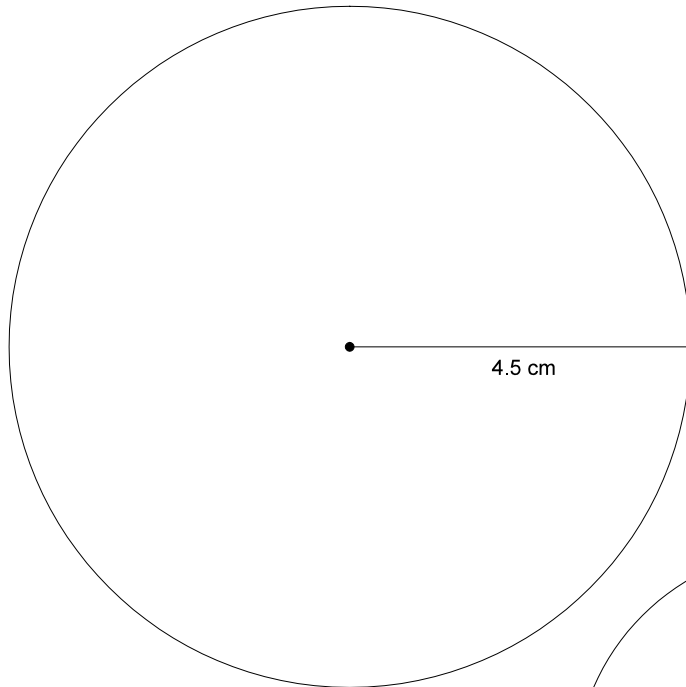
3. O is the centre of the circle.

- a. name the diameter
- b. name two chords
- c. name the tangent line
- d. measure $\angle OVW$

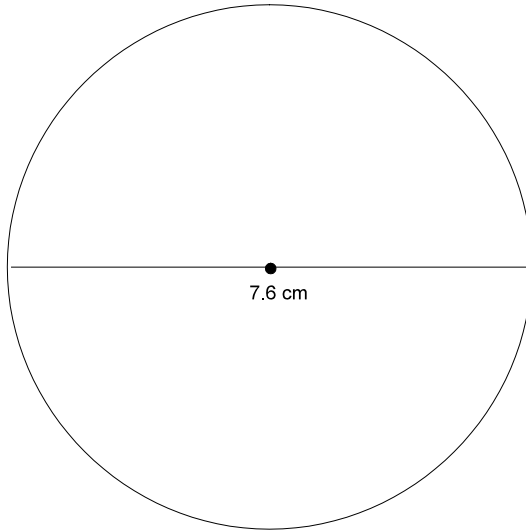
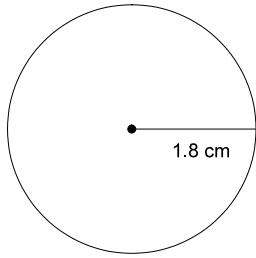


ANSWER KEY

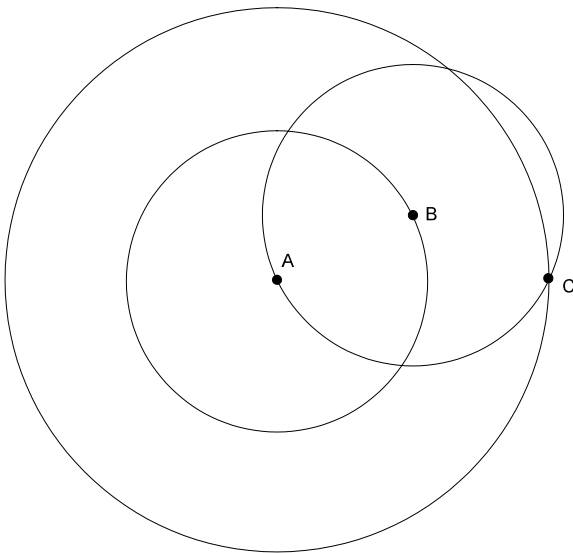
1. a and b



c and d



2.

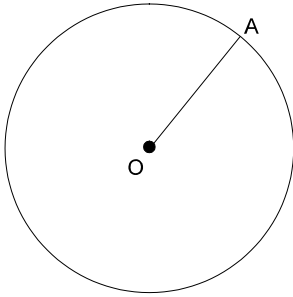


3. a. \overline{RS} b. $\overline{OR}, \overline{OS}, \overline{OV}$ c. $\overline{RS}, \overline{TU}$ d. \overleftrightarrow{WV} e. 90°

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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°

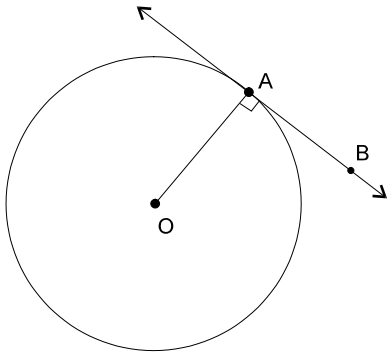
b. radii = 2.5 cm, angle = 90°

c. radii = 3.2 cm, angle = 150°

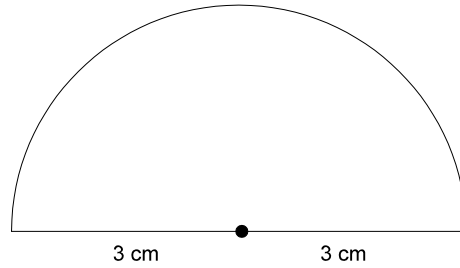
d. radii = 5 cm, angle = 300°

ANSWER KEY

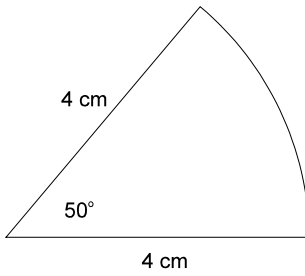
1.



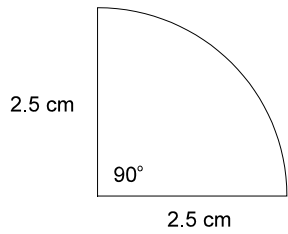
2.



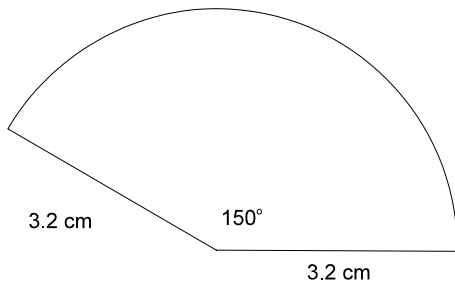
3. a.



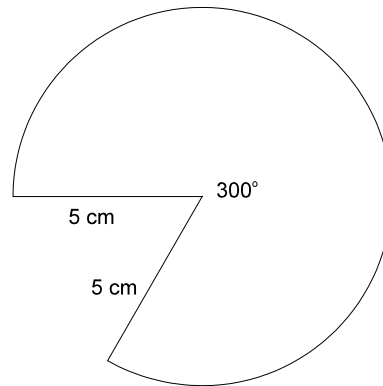
b.



c.



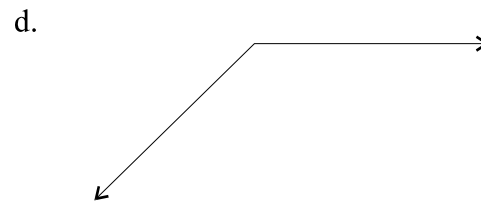
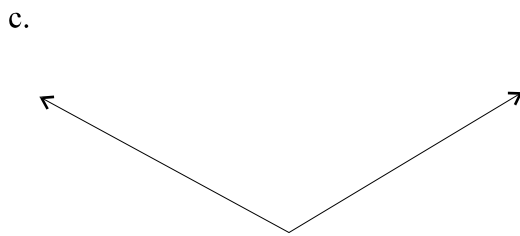
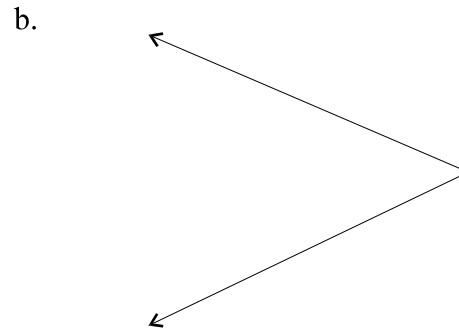
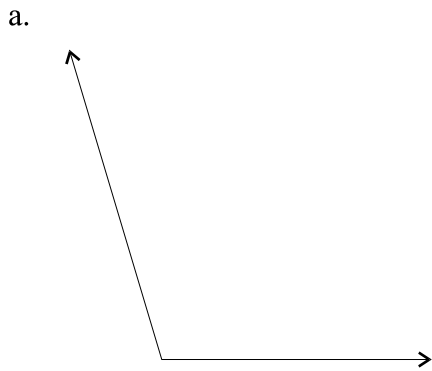
d.



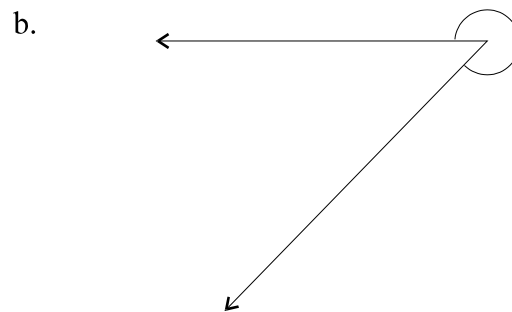
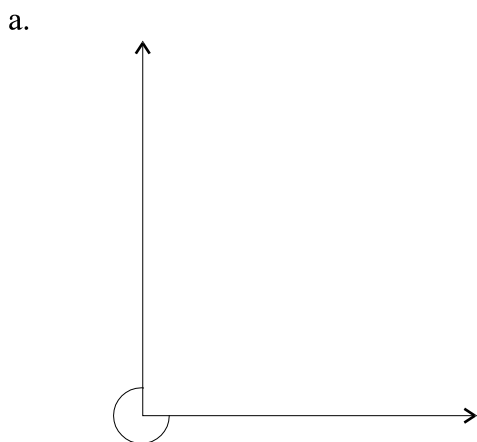
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CONSTRUCTION GEOMETRY 4: CONSTRUCTING BISECTORS

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

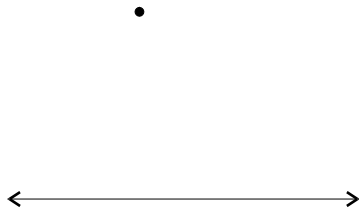


2. Bisect the reflex angles.

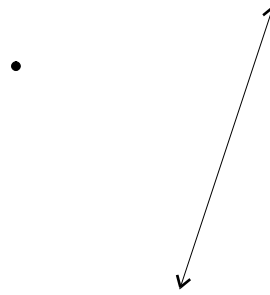


3. Construct a perpendicular line to the given line through the given point.

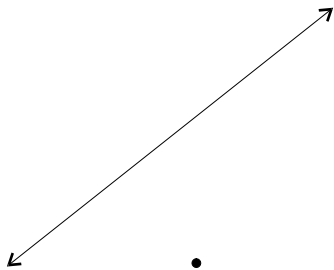
a.



b.

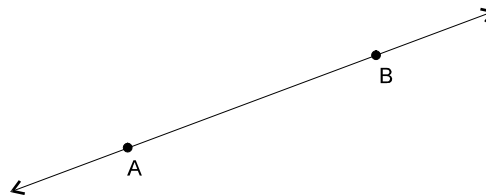


c.

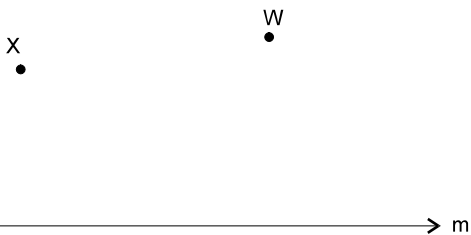


4. Construct the following

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



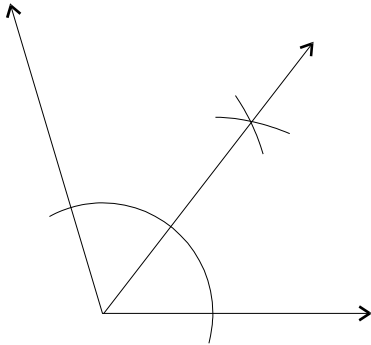
b. lines \overline{XY} and \overline{WZ}
so that $\overleftrightarrow{XY} \perp m$ and $\overleftrightarrow{WZ} \perp m$



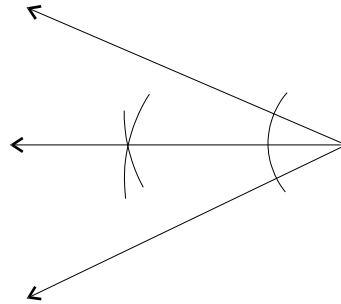
ANSWER KEY

1.

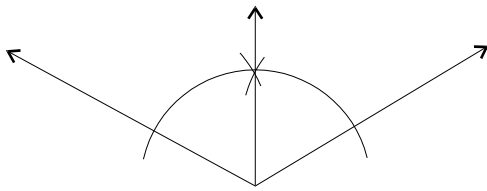
a.



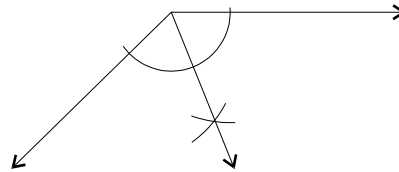
b.



c.

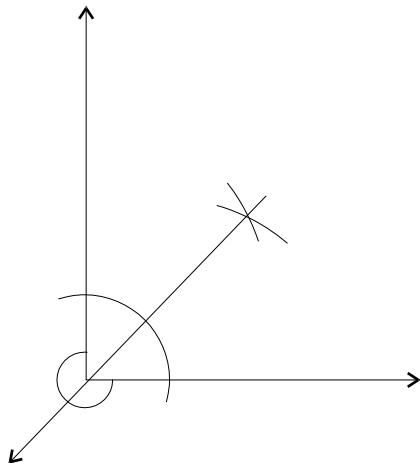


d.

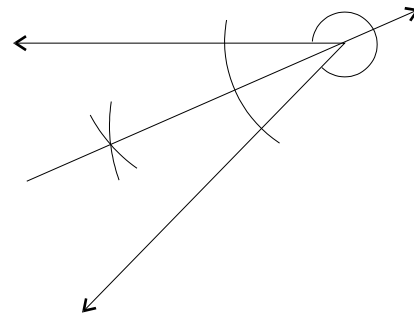


2.

a.

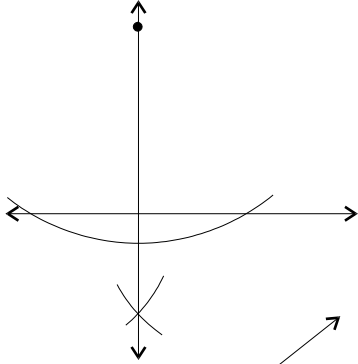


b.

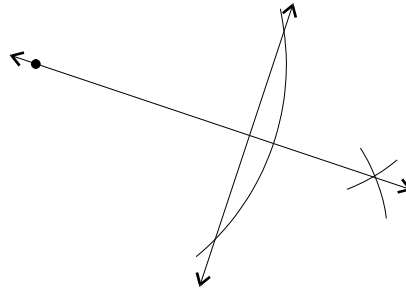


3.

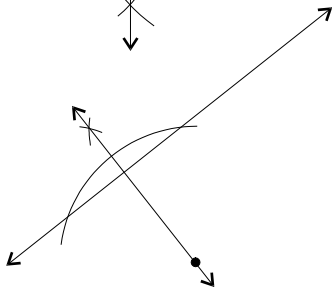
a.



b.

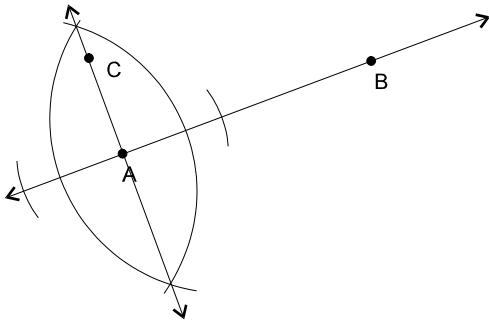


c.

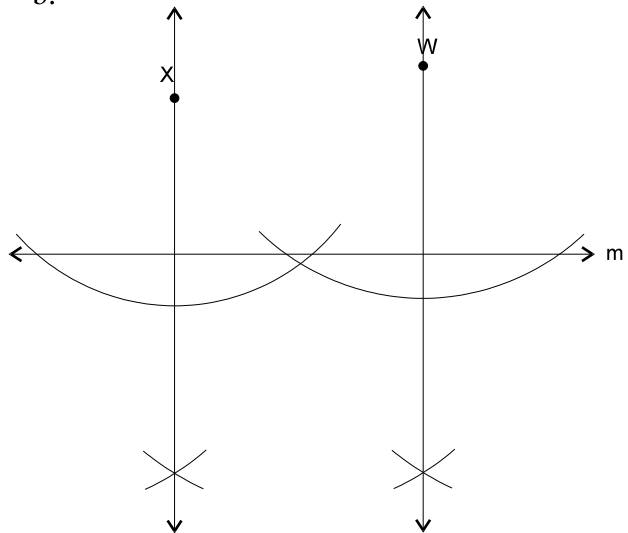


4.

a.



b.



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d. $\triangle HIJ$ where $\overline{IJ} = 7$ cm, $\overline{HI} = 7$ cm and $\angle I = 160^\circ$.

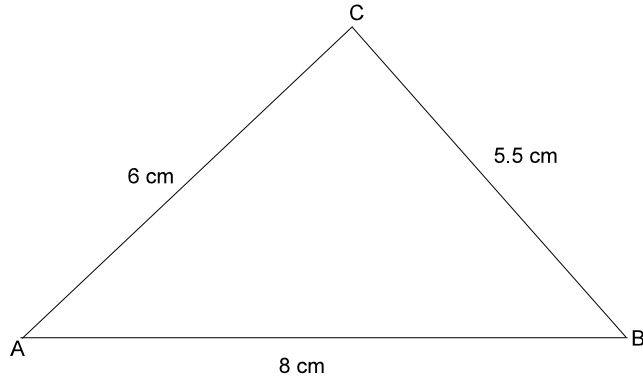
e. $\triangle XYZ$ where $\angle X = 50^\circ$, $\angle Y = 100^\circ$ and $\overline{XY} = 4.8$ cm.

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

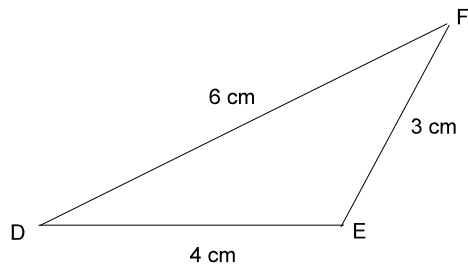
3. Draw an isosceles triangle with sides of 2 cm, 8 cm and 8 cm.

ANSWER KEY

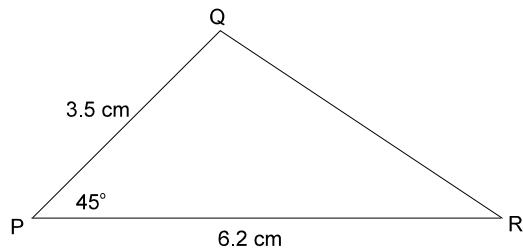
1. a.



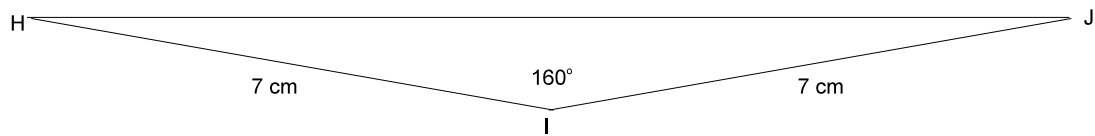
b.



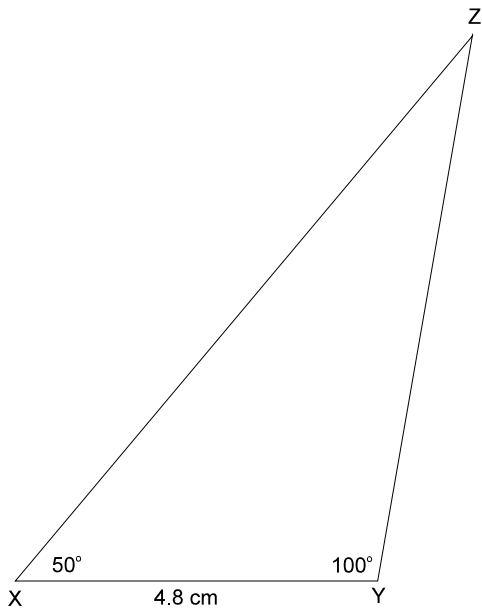
c.



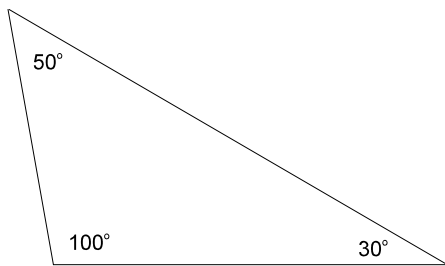
d.



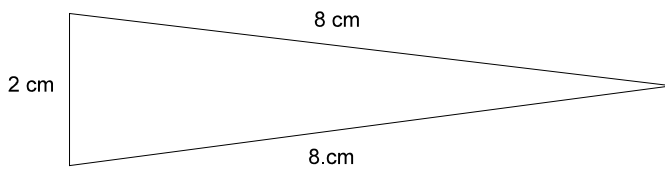
e.



2.



3.



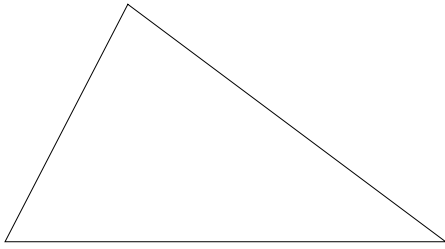
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CONSTRUCTION GEOMETRY 6: DRAWING TRIANGLES

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.

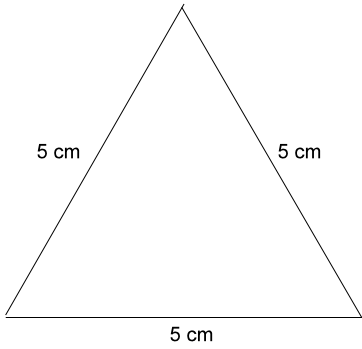


4. Draw two different triangles where:

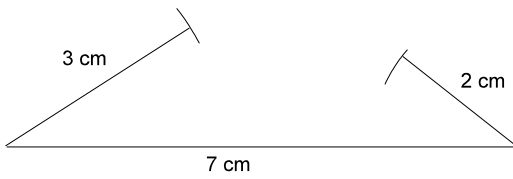
$\triangle ABC$ has $\overline{AB} = 6$ cm, $\angle A = 25^\circ$ and $\overline{BC} = 5$ cm.

ANSWER KEY

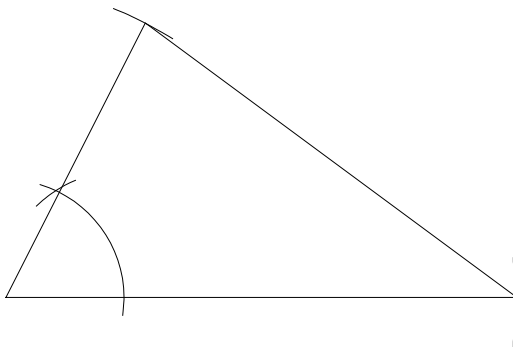
1.



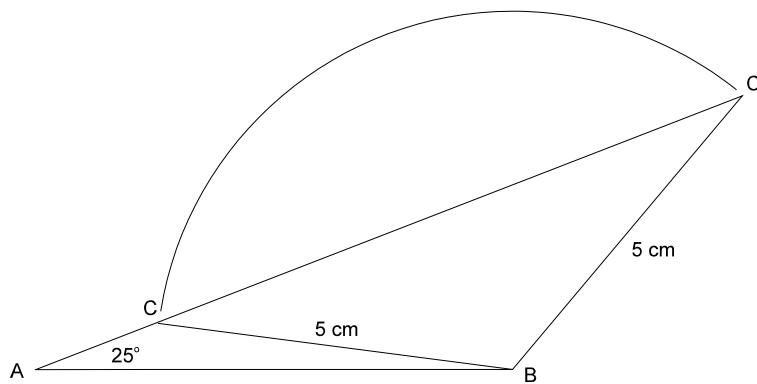
2.



3.



4.



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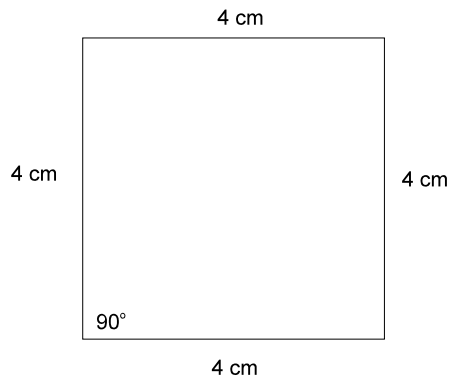
4. Draw a parallelogram MNOP where $\overline{MN} = 4$ cm, $\angle O = 65^\circ$ and $\overline{MP} = 5$ cm.

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

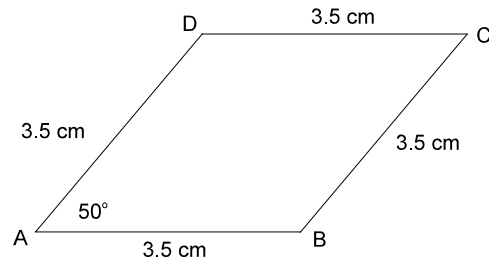
6. Draw a square with 6 cm diagonals.

ANSWER KEY

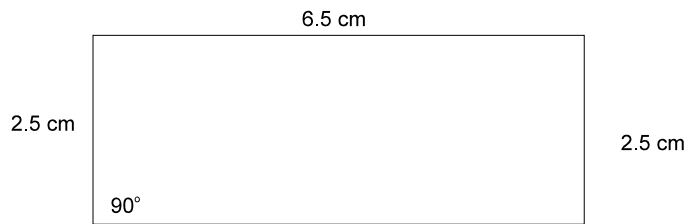
1.



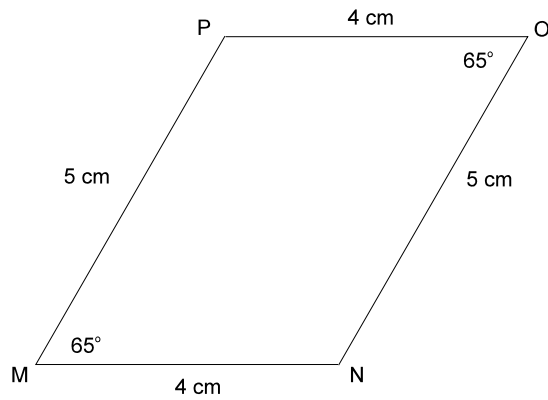
2.



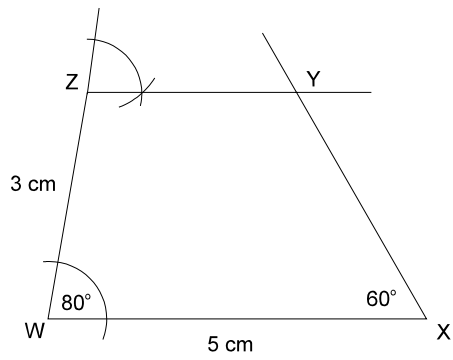
3.



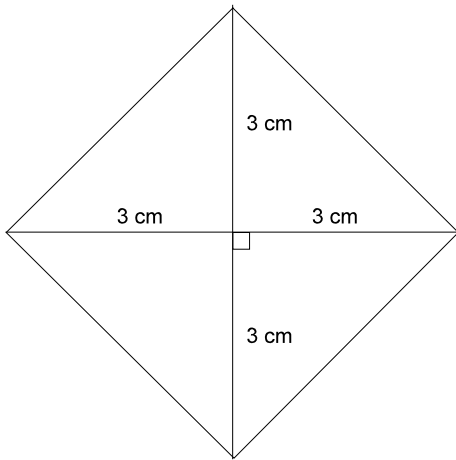
4.



5.



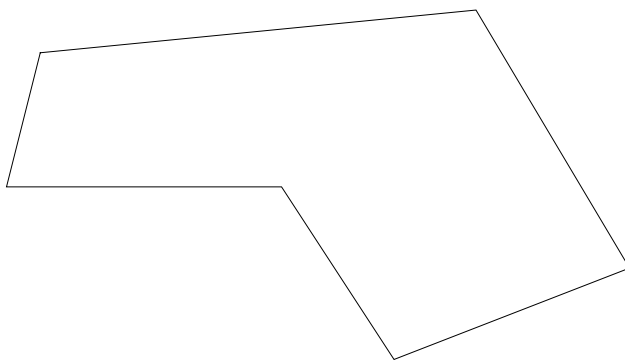
6.



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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.

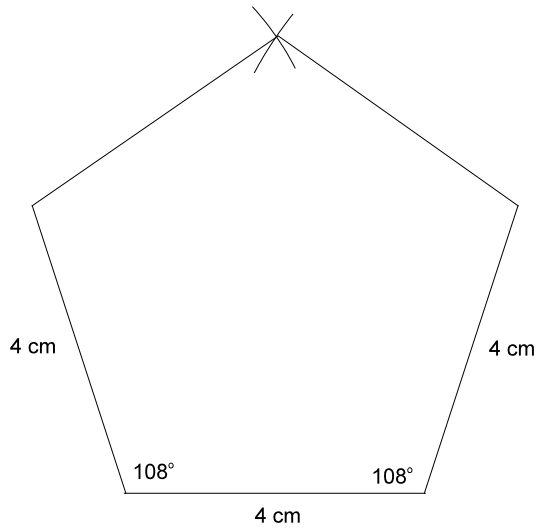
4. Draw a hexagon with 4.5 cm sides.

ANSWER KEY

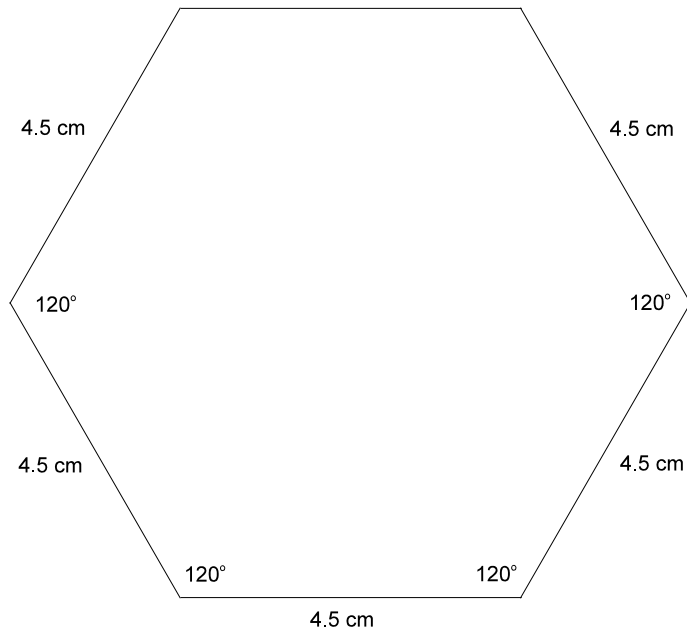
1. sides and angles

2. 720°

3.



4.

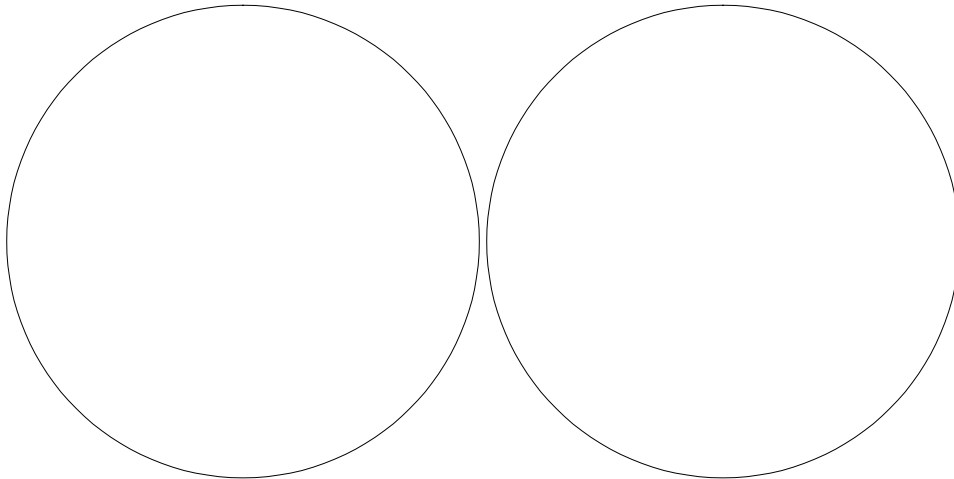


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4. Inscribe the following polygons in the given circles.

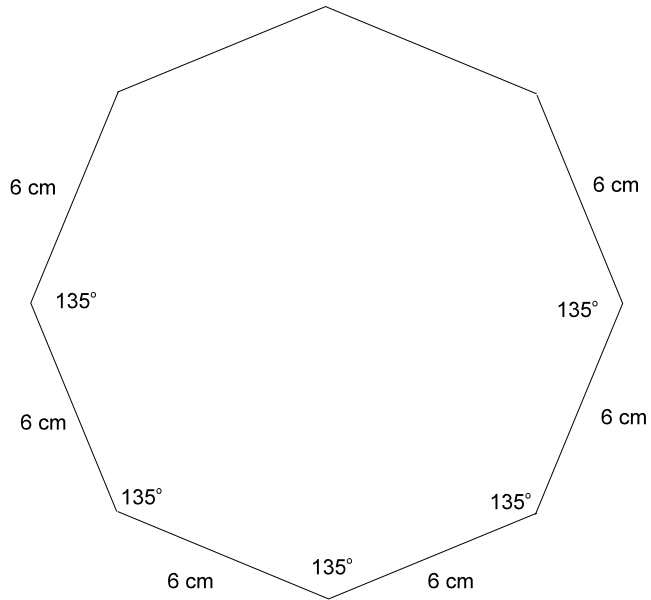
a. square

b. octagon



ANSWER KEY

1.

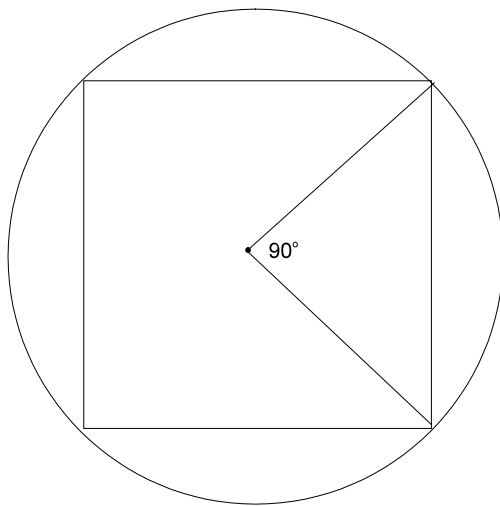


2. a. $180^\circ \times (10 - 2) = 1440^\circ$

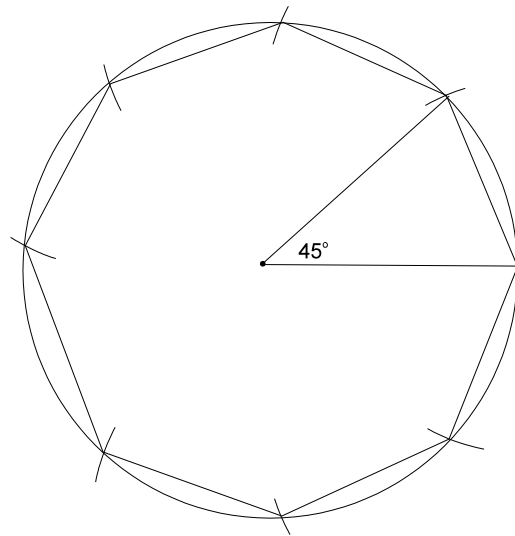
b. $\frac{180^\circ \times (10 - 2)}{10} = 144^\circ$

3. $180^\circ \times (13 - 2) = 1980^\circ$

4. a.



b.



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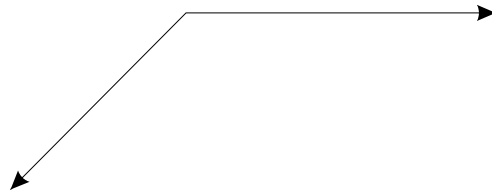
CONSTRUCTION GEOMETRY 10: SUMMARY

1. Draw the following:

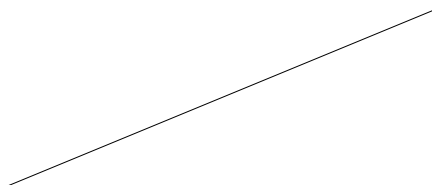
a. A circle with a diameter of 7 cm.

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

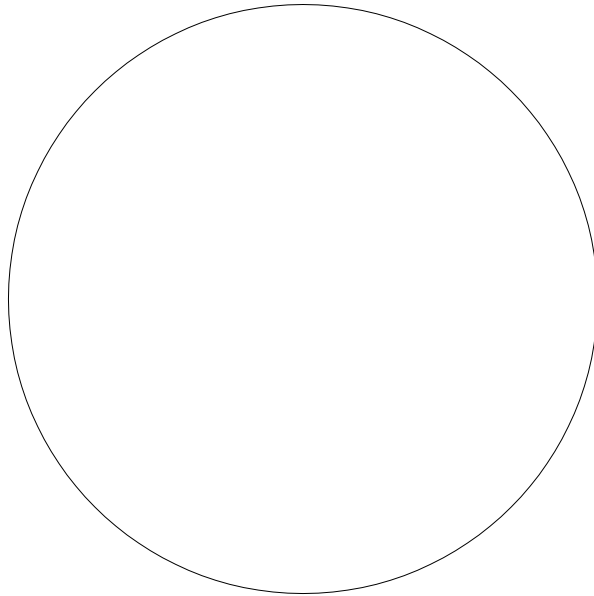
2. Bisect the obtuse angle below using a compass and straightedge.



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



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



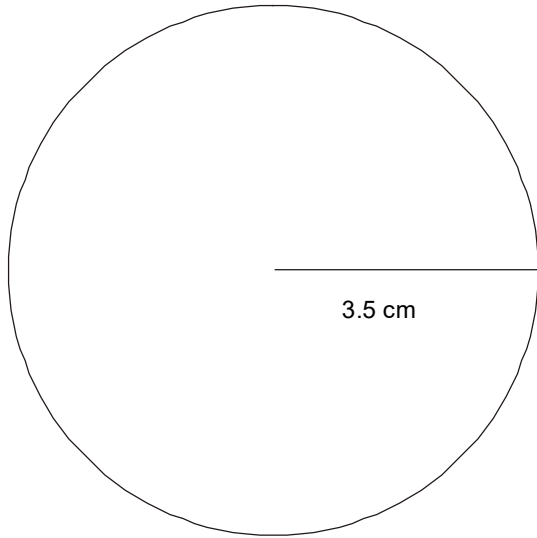
5. Draw the following triangle. Label all parts.

$\triangle ABC$ where $\overline{AB} = 5.5$ cm,

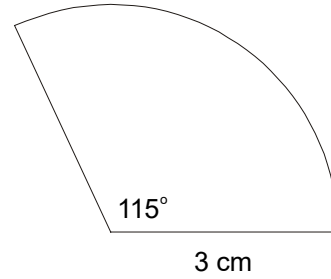
$\angle B = 100^\circ$ and $\overline{BC} = 4$ cm

ANSWER KEY

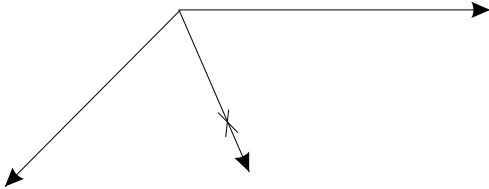
1. a.



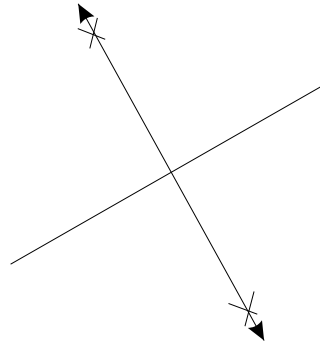
b.



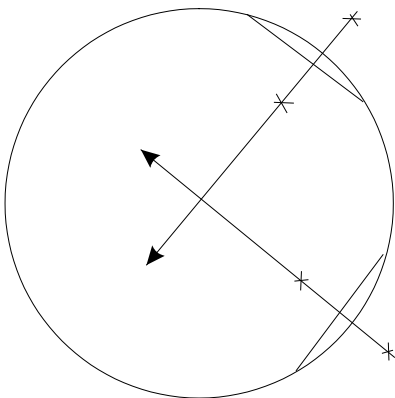
2.



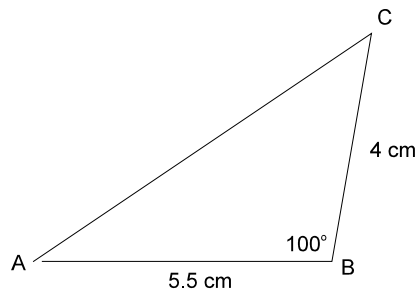
3.



4.



5.



Source: Government of BC used with permission.

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

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

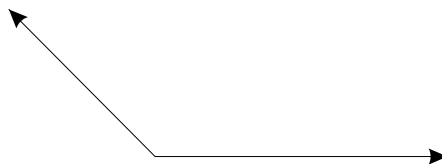


4. Draw the following:

a. A circle with a diameter of 5 cm.

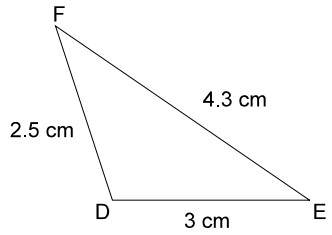
b. A sector with radii of 3 cm and an angle of 130° .

5. Bisect the angle using a compass and straightedge.

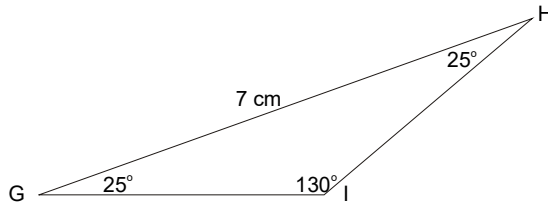


ANSWER KEY

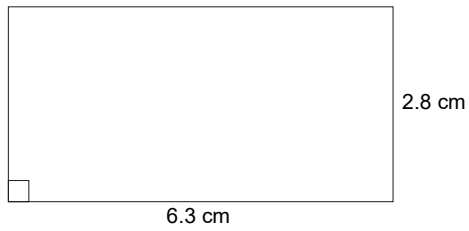
1. a.



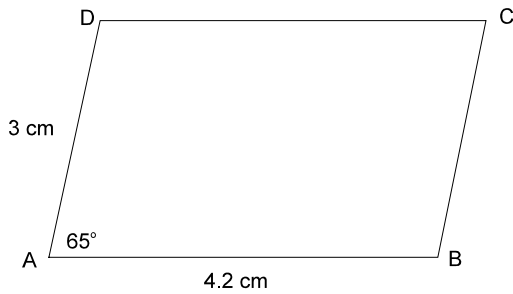
5. b.



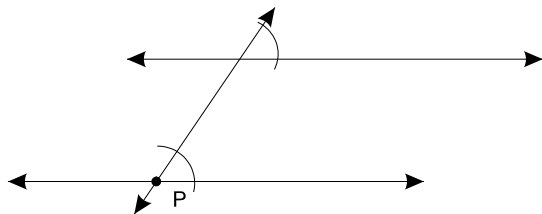
2. a.



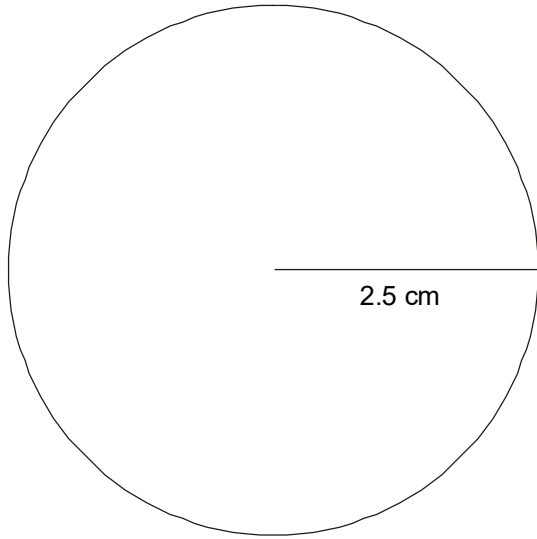
2. b.



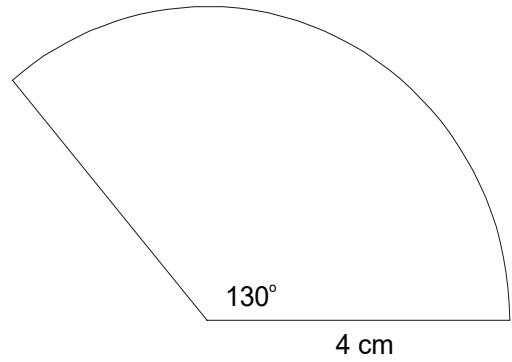
3.



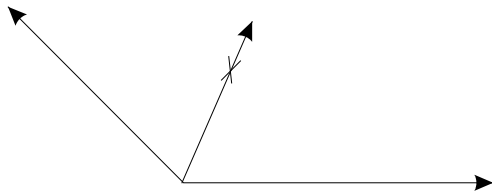
4. a.



b.



5.



Source: Government of BC used with permission.

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 $\angle A = 40^\circ$, $\overline{AB} = 5.5$ cm and $\overline{AD} = 4$ cm.

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

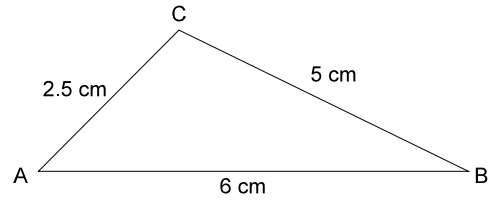
3. Construct a line parallel to n that passes through the point P.

•
P

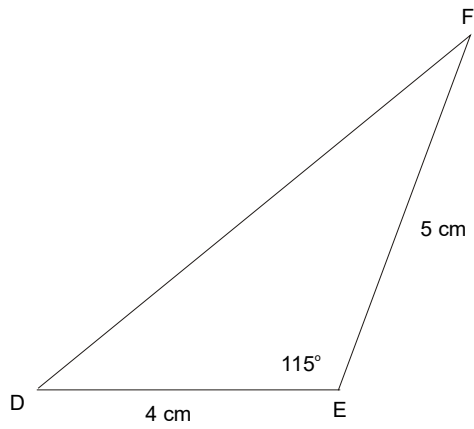


ANSWER KEY

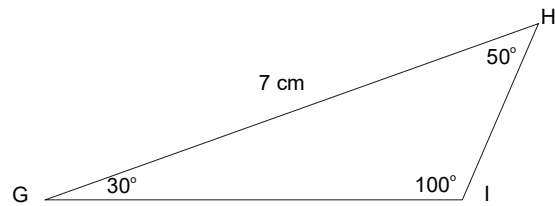
1. a.



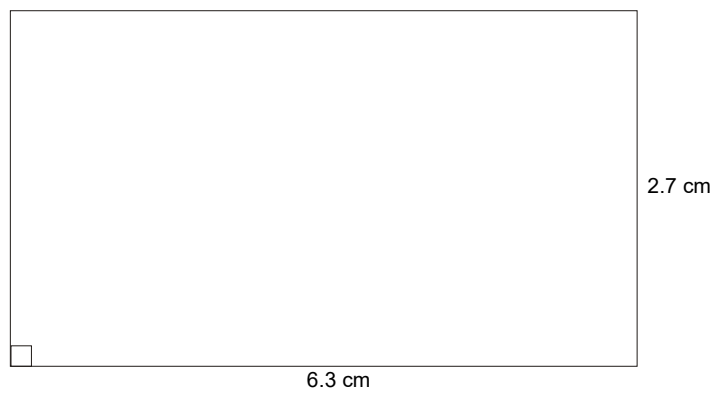
1. b.



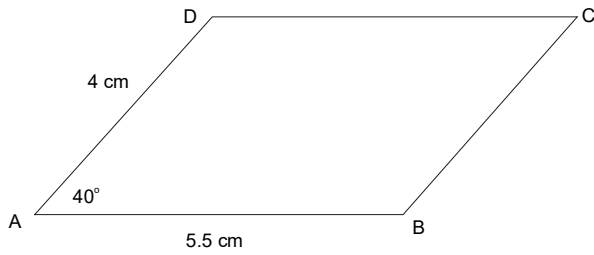
1. c.



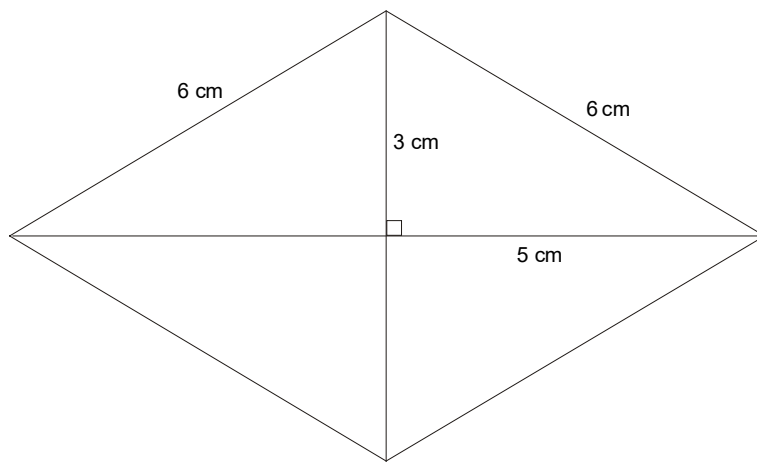
2. a.



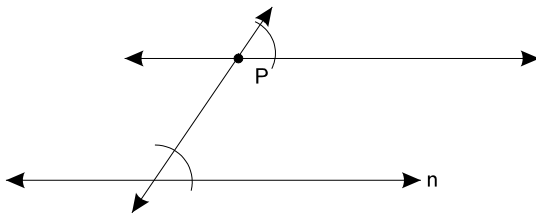
2. b



2. c.



3.



Source: Government of BC used with permission.