

### Geometric Construction Worksheet

1 Match the names to the correct angles:

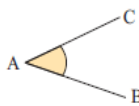
a  $\widehat{ABC}$

b  $\widehat{CAB}$

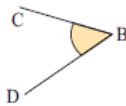
c  $\widehat{BCA}$

d  $\widehat{CBD}$

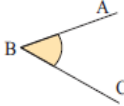
**A**



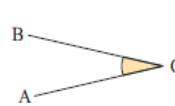
**B**



**C**



**D**



2 Draw and label each of the following angles:

a  $\widehat{DEF}$

b  $\widehat{ZXY}$

c  $\widehat{XYZ}$

d  $\widehat{PQR}$

e reflex  $\widehat{RPQ}$

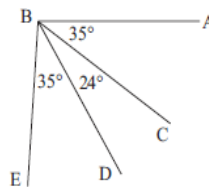
3 Find the size of these angles without your protractor:

a  $\widehat{ABC}$

b  $\widehat{DBC}$

c  $\widehat{ABD}$

d  $\widehat{ABE}$



4 Use your ruler and protractor to draw angles with the following sizes:

a  $35^\circ$

b  $131^\circ$

c  $258^\circ$

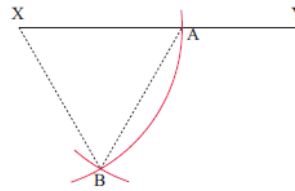
Get someone else to check the accuracy of your angles.

- 1
  - a Use your protractor to draw accurately  $\widehat{ABC}$  of size  $50^\circ$ .
  - b Use a compass and ruler only to bisect  $\widehat{ABC}$ .
  - c Use a protractor to check the accuracy of your construction.
- 2
  - a Use your protractor to draw accurately  $\widehat{PQR}$  of size  $122^\circ$ .
  - b Use a compass and ruler only to bisect  $\widehat{PQR}$ .
  - c Use a protractor to check the accuracy of your construction.
- 3
  - a Draw any triangle ABC and carefully bisect its three angles.
  - b Repeat with another triangle DEF of different shape.
  - c Check with other students in your class for any observations about the three angle bisectors.
  - d Copy and complete: "The three angle bisectors of a triangle .....".



- 4 a Use a set square or a protractor to draw an angle of  $90^\circ$ . Let this angle be  $\widehat{PQR}$ .  
 b Bisect  $\widehat{PQR}$  using a compass and ruler only. Check that each angle measures  $45^\circ$ .  
 c Using a compass and ruler only, construct an angle measuring  $22\frac{1}{2}^\circ$ .

- 5 a [XY] is a line segment 5 cm long. At X an arc is drawn to cut [XY] at A. Keeping the same radius another arc is drawn with centre A to cut the first arc at B. [AB] and [BX] are then joined by straight line segments.



Explain why triangle ABX is equilateral.

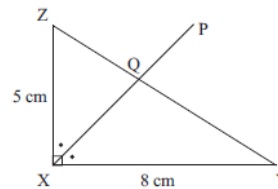
- b What is the size of angle  $\widehat{AXB}$ ?  
 c Perform the construction in a. Use it to construct angles of size:  
 i  $30^\circ$                       ii  $15^\circ$ .

- 6 a Accurately draw the line segment [AB] as shown. Mark on it the points A, B and C.



- b Use a compass and ruler construction to draw right angles at B above the line segment [AB], and at C below [AB].

- 7 a Draw a line segment [XY] of length 8 cm.  
 b At X use a compass and ruler to construct a  $90^\circ$  angle.  
 c Draw [XZ] of length 5 cm and join [ZY] as shown.  
 d Measure [ZY] to the nearest mm.



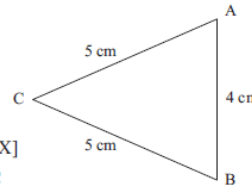
- e Bisect  $\widehat{ZXY}$  using a compass and ruler only.  
 f Find by measuring:  
 i the length of [QY]      ii the size of  $\widehat{XQY}$ .

- 10 a Accurately construct the isosceles triangle illustrated. Use a compass and ruler to do this.

- b Bisect  $\widehat{ACB}$  using a compass.

- c If the bisector in b meets [AB] at point X, measure:

- i the length of [AX]      ii the length of [BX]  
 iii the size of  $\widehat{ACB}$       iv the size of  $\widehat{AXC}$



- 11 a Draw a line segment [PQ] where  $PQ = 5$  cm.  
 b Use a compass and ruler to construct the perpendicular bisector of [PQ].  
 c If the perpendicular bisector of [PQ] meets [PQ] at Y, measure the lengths of [PY] and [QY].  
 12 a Draw any triangle ABC and construct the perpendicular bisectors of its three sides.  
 b Repeat with another triangle PQR of different shape.  
 c What do you observe from a and b?  
 d Copy and complete: "The three perpendicular bisectors of the sides of a triangle ....."

- 13 a In the figure alongside, the line segment [AB] has been perpendicularly bisected. Repeat this construction with  $AB = 4$  cm.

- b Choose P on the perpendicular bisector such that the length of [MP] is 3.5 cm.

- c Measure the lengths of [AP] and [BP]. What do you notice?

- d Measure  $\widehat{APM}$  and  $\widehat{BPM}$  with a protractor. What do you notice?

