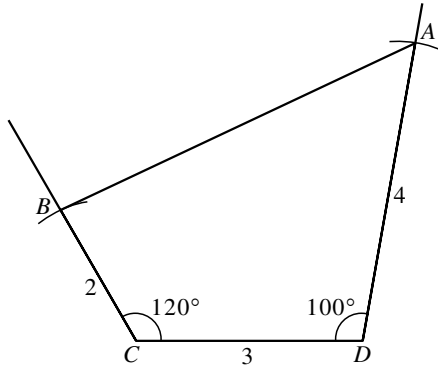




11. Construct a quadrilateral $ABCD$ in which $AD = 4$ cm, $BC = 2$ cm, $CD = 3$ cm, $\angle C = 120^\circ$ and $\angle D = 100^\circ$.

Solution



Construction Steps:

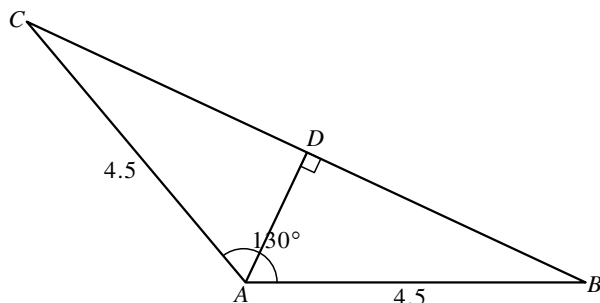
1. Draw a line segment CD 3 cm long.
2. Draw a ray with end point C and making an angle of 120° with CD .
3. Mark a point B on the ray such that $BC = 2$ cm.
4. Draw a ray with end point D on the same side of CD as BC such that it makes an angle of 100° with CD .
5. Mark a point A on the previous ray such that $AD = 4$ cm.
6. Join A and B . Then $ABCD$ is the required quadrilateral.

Maths@Work

12. (a) Construct $\triangle ABC$ in which $AB = 4.5$ cm, $AC = 4.5$ cm and $\angle BAC = 130^\circ$ using Sketchpad.
 (b) Measure $\angle ABC$ and $\angle ACB$ correct to the nearest degree.
 (c) Draw a perpendicular line from A to meet the line BC at D .
 (d) Measure the lengths of BD and CD and give your answers correct to the nearest 0.1 cm.
 (e) What do you observe from the result in (d)?

Solution

(a)



Construction Steps:

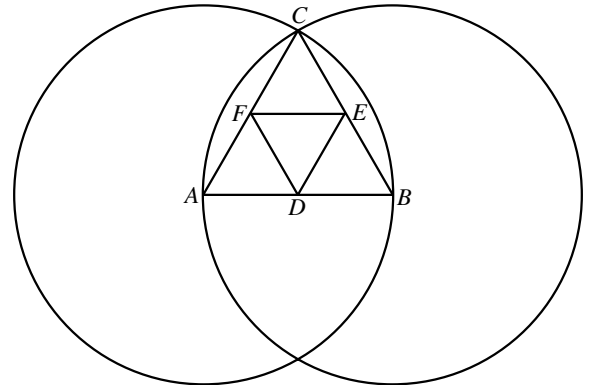
1. Draw a line segment AB 4.5 cm long.
2. Rotate AB about A for 130° to AC .
3. Join B and C . Then $\triangle ABC$ is the required triangle.

- (b) $\angle ABC = 25^\circ$ (correct to the nearest degree)
 $\angle ACB = 25^\circ$ (correct to the nearest degree)
 (d) $BD = 4.1$ cm (correct to the nearest 0.1 cm)
 $CD = 4.1$ cm (correct to the nearest 0.1 cm.)
 (e) When $AB = AC$, the perpendicular AD from A to BC bisects BC .

13. (a) Draw an equilateral triangle ABC using Sketchpad.
 (b) Plot the midpoints D, E and F of the sides AB, BC and CA .
 (c) Draw $\triangle DEF$.
 (d) What type of triangle is $\triangle DEF$?
 (e) Find the value of $\frac{DE}{AB}$.

Solution

(a)



Construction Steps:

1. Draw a line segment AB .
2. Draw two circles with centres at A and B and equal radii AB .
3. Mark C as one of the intersecting points of the circles.
4. Draw the line segments AC and BC . Then $\triangle ABC$ is an equilateral triangle.

- (b) Use the midpoint command to create the midpoints D, E, F of the sides AB, BC and CA .
 (c) Draw the line segments DE, EF and FD to form $\triangle DEF$.
 (d) $\triangle DEF$ is an equilateral triangle.
 (e) $\frac{DE}{AB} = 0.5$