1

Calculate x

NOT DRAWN TO SCALE

2

Calculate θ
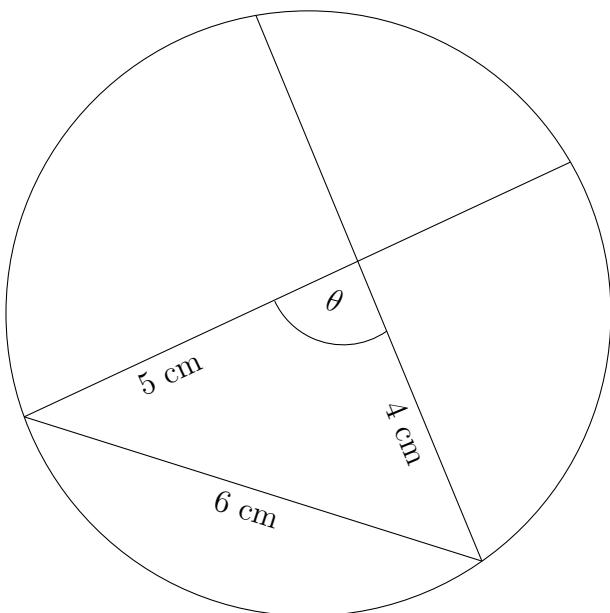
NOT DRAWN TO SCALE

3

NOT DRAWN TO SCALE
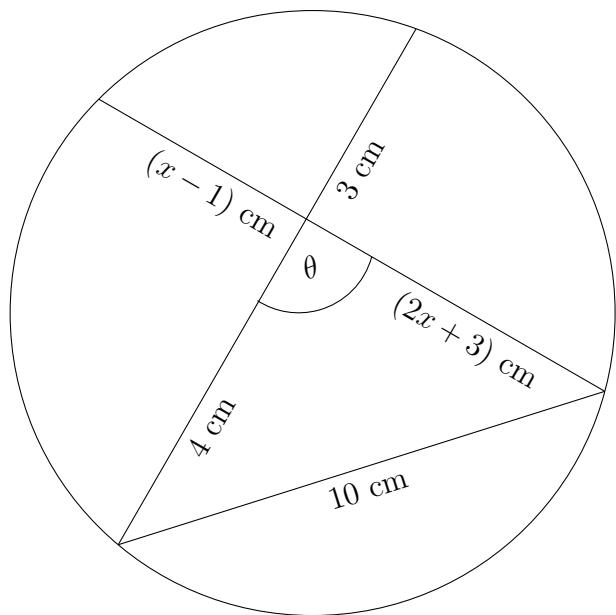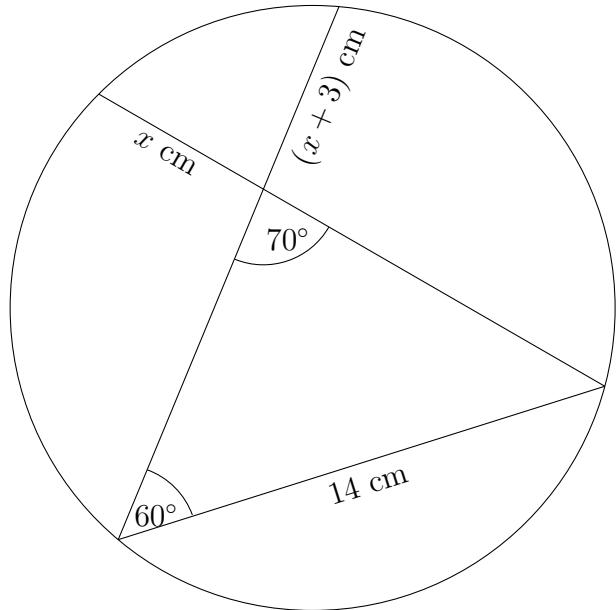
Calculate θ

4

NOT DRAWN TO SCALE

**Calculate x**

5

Find the area of triangle PBC

1
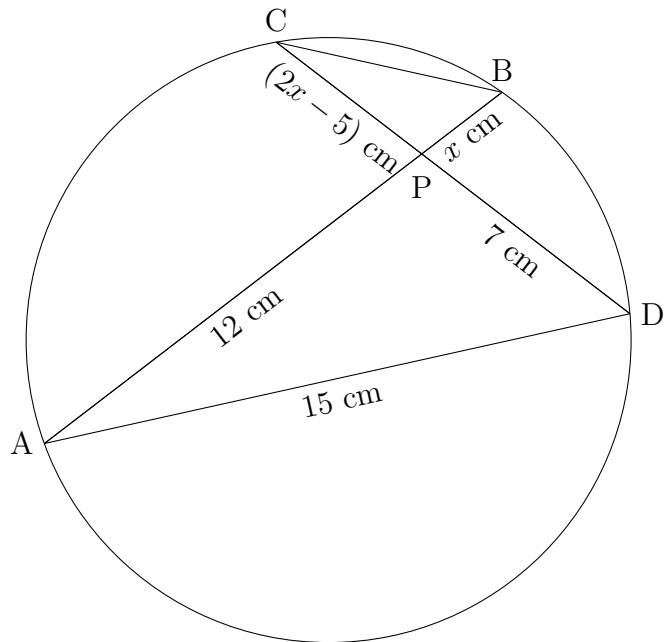
Calculate x
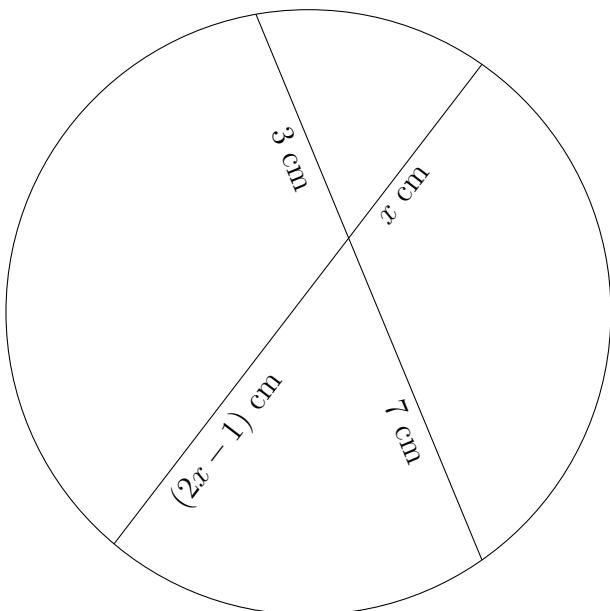
NOT DRAWN TO SCALE

$$(2x-1)(x) = 21$$
$$2x^2 - x = 21$$
$$2x^2 - x - 21 = 0$$
$$(2x - 7)(x + 3)$$
$$x = 3.5$$

2

Calculate θ
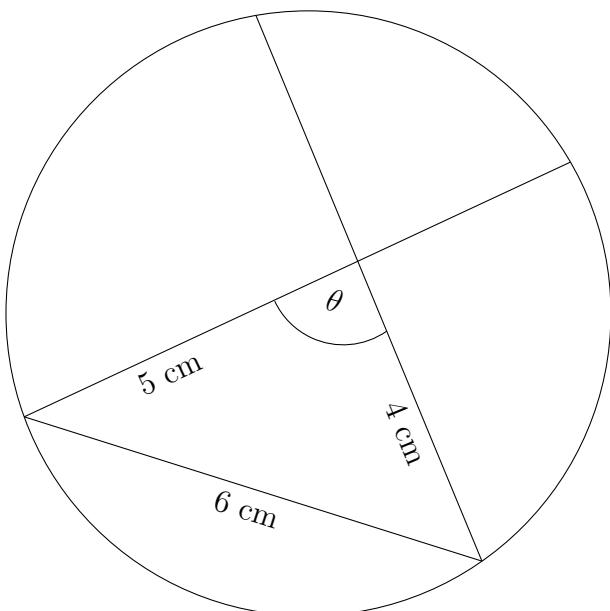
NOT DRAWN TO SCALE

$$6^2 = 4^2 + 5^2 - 2(4)(5)\cos\theta$$

$$\cos\theta = \frac{4^2 + 5^2 - 6^2}{2(4)(5)}$$

$$\theta = 82.8°$$

3

NOT DRAWN TO SCALE
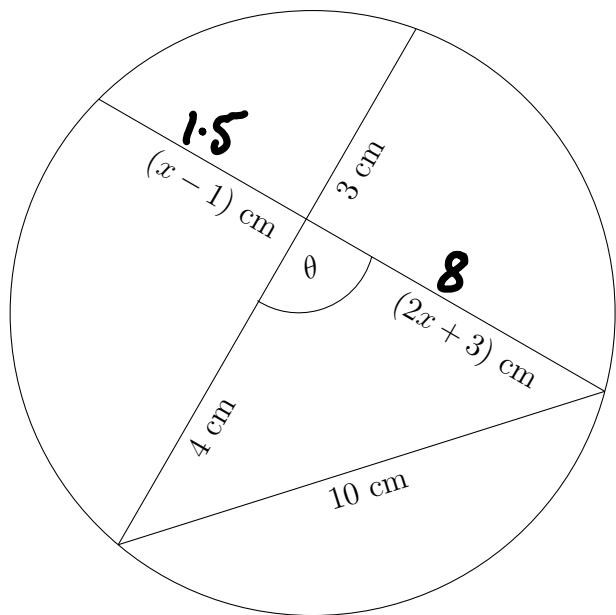
Calculate θ

$(2x+3)(x-1) = 12$

$2x^2 + 3x - 2x - 3 = 12$

$2x^2 + x - 15 = 0$

$(2x - 5)(x + 3)$

$x = 2.5$

$\cos\theta = \dfrac{4^2 + 8^2 - 10^2}{2(4)(8)}$

$\theta = 108.2°$

4

NOT DRAWN TO SCALE

Calculate x
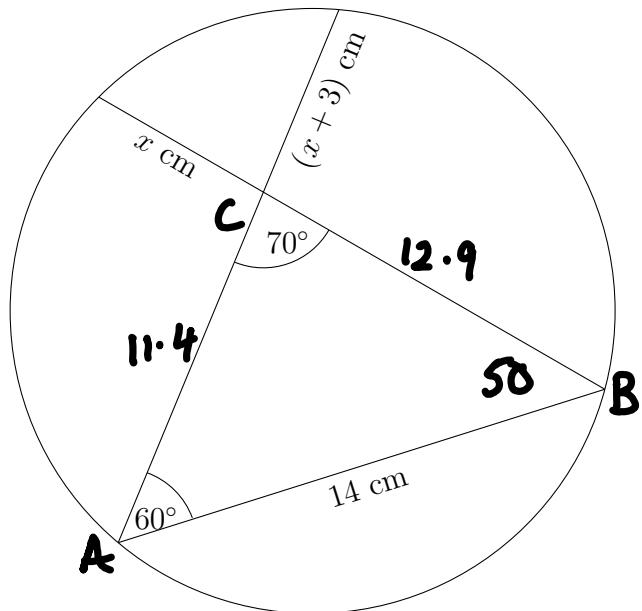
$\dfrac{a}{\sin 60°} = \dfrac{b}{\sin 50°} = \dfrac{14}{\sin 70°}$

$a = \dfrac{14\sin 60°}{\sin 70°} = 12.9\,cm$

$b = \dfrac{14\sin 50°}{\sin 70°} = 11.4$

$12.9x = 11.4(x+3)$

$12.9x = 11.4x + 34.2$

$1.5x = 34.2$ $x = 23\,cm$

5

Find the area of triangle PBC

Diagram: A circle with points C, B on the upper edge and A, D on the lower/right. Chords AD and CD are drawn, intersecting at P.
- Segment C to P: (2x − 5) cm, labelled 30
- Segment P to B: x cm, labelled 17.5
- Segment A to P: 12 cm
- Segment P to D: 7 cm
- Segment A to D: 15 cm
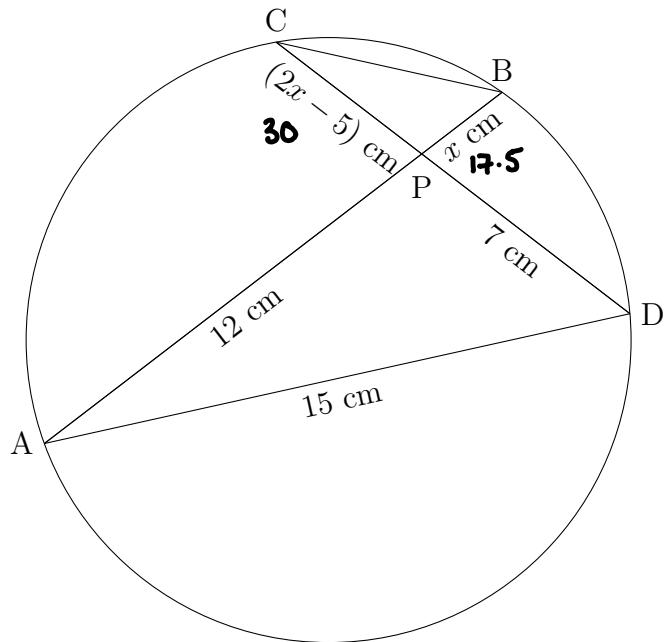
$$12x = 14x - 35$$

$$2x = 35$$

$$x = 17.5$$

APD:

$$\cos\theta = \frac{12^2 + 7^2 - 15^2}{2(12)(7)}$$

$$\theta = 101°$$

$$\text{Area } PBC = \tfrac{1}{2}(b)(c)\sin P$$

$$\tfrac{1}{2}(17.5)(30)\sin 101°$$

$$= 257.7 \text{ cm}^2$$