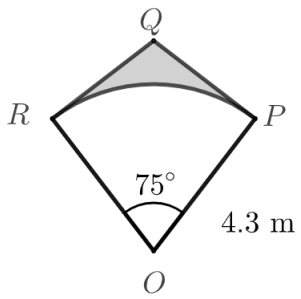
Question 1

$OPR$ is a sector of a circle with centre $O$ and radius 4.3 m.
$QR$ and $QP$ are tangent to the circle at points $R$ and $P$.
Find the shaded area, correct to
3 significant figures.




Question 2

The first three terms of a geometric sequence are:

$x - 3, \quad 6, \quad x + 2$ ,...

Find the possible values of $x$.

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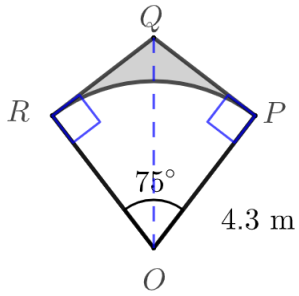


$ORQ$ and $OPQ$ are congruent right-angled triangles with base 4.3 m and height

$4.3\tan(37.5°) = 3.2995$ m

The kite $OPQR$ therefore has area

$2 \times \dfrac{4.3 \times \ 3.2995}{2} \times = 14.1879$ m$^2$.

Sector $OPR$ has area $\dfrac{75}{360} \times \pi \times 4.3^2$

$= 12.1017$ cm$^2$

So shaded area $=$ $14.1879$ $- 12.1017$ $=$ $2.09$ cm$^2$ (to 3 s.f.)

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Find the possible values of $x$.

$$\frac{6}{x-3} = \frac{x+2}{6} \implies 36 = (x-3)(x+2)$$

$$\implies 36 = x^2 - 1x - 6$$

$$\implies 0 = x^2 - x - 42$$

Solving, we see $x = 7$, $x = -6$