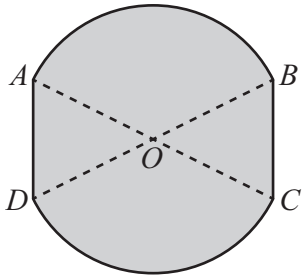
2



The diagram shows the shaded region $ABCD$.
The lines AC and BD each have a length of 12 cm.
The lines AC and BD bisect each other at the point O.
The lines AD and BC are parallel and each have a length of 4 cm.
The arcs AB and DC are part of a circle centre O.

(a) Find the obtuse angle AOB.
Give your answer in radians. [3]

Use your answer to **part (a)** to find

(b) (i) the perimeter of the shaded region [2]

(ii) the area of the shaded region. [3]

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3 Find the exact value of the term independent of x in the expansion of $\left(2+\frac{3}{x^2}\right)^{10}\left(1-4x^2\right)^2$. [6]