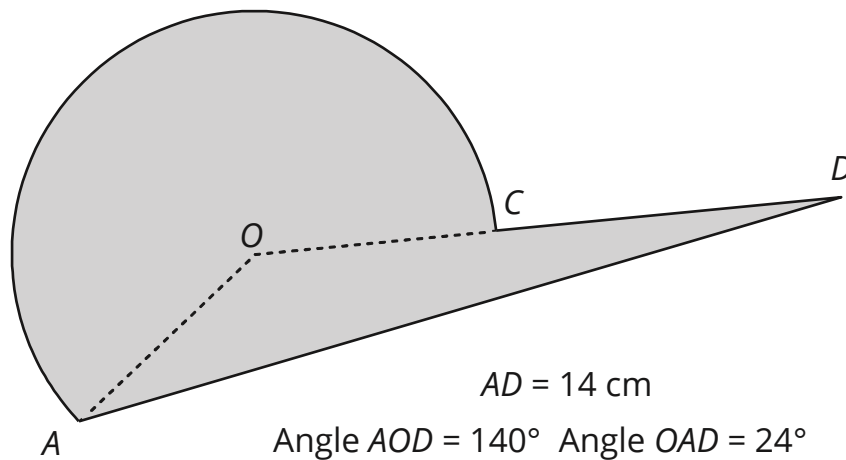


Maths Questions

Q1: Skills needed: Knowledge of the area of a sector and sine rule

1) An engineer has to work out the perimeter of this shape to be used as a template in a factory.



The shape is made of a triangle and sector of a circle, centre O and radius 6 cm . OCD is a straight line. Give your answer correct to 3 significant figures.

Q2) Skills needed: logical reasoning, time calculation and substitution

A hot air balloon is descending.

The height of the balloon n minutes after it starts to descend is h_n metres.

The height of the balloon $(n + 1)$ minutes after it starts to descend, h_{n+1} metres, is given by

$$h_{n+1} = K \times h_n + 20 \quad \text{where } K \text{ is a constant.}$$

The balloon starts to descend from a height of 1200 metres at $09:15$

At $09:16$ the height of the balloon is 1040 metres.

Work out the height of the balloon at $09:18$

Science Questions

1. Good quality water is needed for a healthy life. In the United Kingdom, obtaining safe water for drinking is as simple as turning on a tap. The water is made safe to drink by water companies. However, in many parts of Africa and Asia, water used for drinking is contaminated and untreated. It is estimated that 2.2 million people die each year as a result of drinking contaminated water.

Dada Daneshananda, Man with filtered water from the Mafi-Zongo water project.
www.amurt.net/africa/ghana/2005 1

(a) Sea water is not used as drinking water. Suggest why.

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..... (1)

(b) Explain why water for drinking is filtered and then treated with chlorine.

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.....
..... (2)

2. Read the following information and then answer the questions.

Chlorine – for better, for worse? Chlorine is used to make bleaches, plastics and medicines. Swimming pool water is often treated with chlorine. Chlorine is used to make water safe to drink. It is relatively cheap and easy to use. People who drink untreated water risk dying from typhoid and cholera. However, chlorine is a poisonous chemical. It causes breathing difficulties and can kill people. Some people are also allergic to chlorine.

(a) How does chlorine make water safe to drink?

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..... (1)

(b) The amount of chlorine in swimming pool water should be carefully monitored and controlled. Explain why.

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..... (2)