

Monster Questions – Set 6

Question 1

The functions g and h are defined as

$$g(x) = \frac{x}{2x - 5}$$

$$h(x) = x + 4$$

(a) Find the value of $g(1)$

(1)

(b) State which value of x must be excluded from any domain of g

(1)

(c) Find $gh(x)$
Simplify your answer.

$$gh(x) = \frac{\dots}{\dots}$$

(2)

(d) Express the inverse function g^{-1} in the form $g^{-1}(x) = \dots$

Question 2

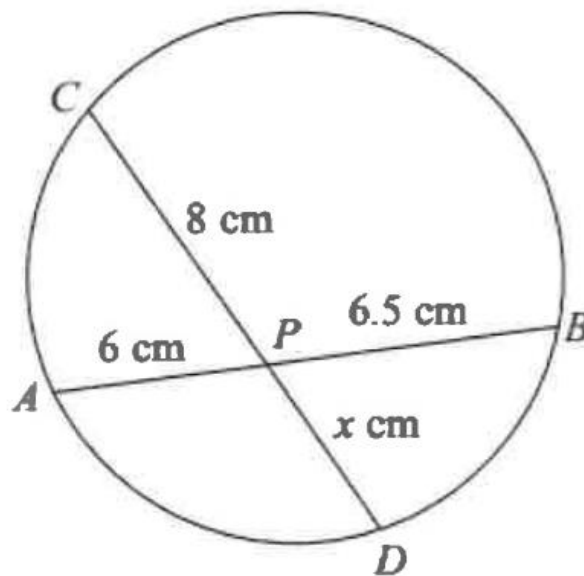


Diagram **NOT**
accurately drawn

APB and CPD are chords of a circle.

$AP = 6 \text{ cm}$, $PB = 6.5 \text{ cm}$, $CP = 8 \text{ cm}$, $PD = x \text{ cm}$

Work out the value of x .

Question 3

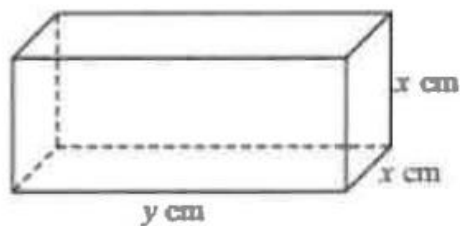


Diagram **NOT**
accurately drawn

The diagram shows a cuboid of volume $V \text{ cm}^3$

The length of the cuboid is $y \text{ cm}$

The width and height of the cuboid are both $x \text{ cm}$

The total length of all the edges of the cuboid is 112 cm

(a) Show that $V = 28x^2 - 2x^3$

(3)

(b) Find $\frac{dV}{dx}$

$$\frac{dV}{dx} = \underline{\hspace{2cm}}$$

(2)

(c) Find the maximum value of V

Give your answer correct to 3 significant figures.

Question 4

✓ The size of each interior angle of a regular polygon with n sides is 140°

✓ Work out the size of each interior angle of a regular polygon with $2n$ sides.

Question 5

The diagram shows a sector $OAPB$ of a circle, centre O .

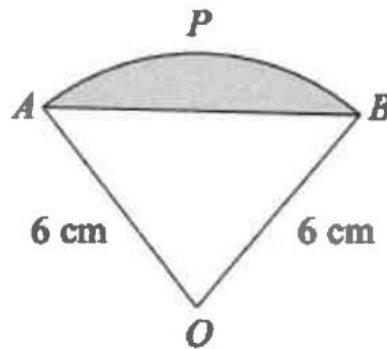


Diagram **NOT**
accurately drawn

AB is a chord of the circle.

$OA = OB = 6$ cm.

The area of sector $OAPB$ is 5π cm²

Calculate the perimeter of the shaded segment.

Give your answer correct to 3 significant figures.