

20 Solve the simultaneous equations

$$y = 7 - 2x$$
$$x^2 + y^2 = 34$$

Show clear algebraic working.

DO NOT WRITE IN THIS AREA

.....
(Total for Question 20 is 5 marks)



21 Given that the surface area of a sphere is $49\pi\text{cm}^2$

find the volume of the sphere.

Give your answer correct to the nearest integer.

..... cm^3

(Total for Question 21 is 3 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

- 22 Solve the inequality $6x^2 + 37x \leq 35$
Show clear algebraic working.

.....
(Total for Question 22 is 3 marks)

Turn over for Question 23



P 7 2 4 4 3 A 0 2 1 2 8

23 The diagram shows a solid prism $ABCDEFGHJ$

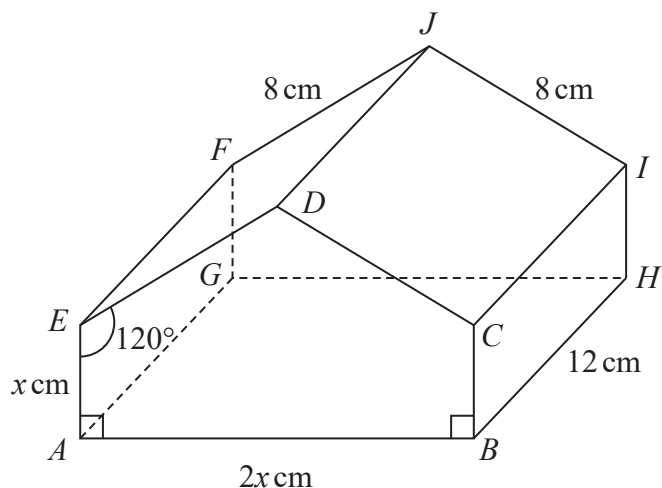


Diagram NOT
accurately drawn

The prism is such that each cross section is a pentagon where

$$AE = BC = x \text{ cm}$$

$$AB = 2x \text{ cm}$$

$$ED = CD = 8 \text{ cm}$$

$$\text{angle } EAB = \text{angle } CBA = 90^\circ$$

$$\text{angle } AED = \text{angle } BCD = 120^\circ$$

Given that $AG = BH = EF = DJ = CI = 12 \text{ cm}$

calculate the angle that AJ makes with the base $ABHG$ of the prism.

Give your answer correct to 3 significant figures.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

o

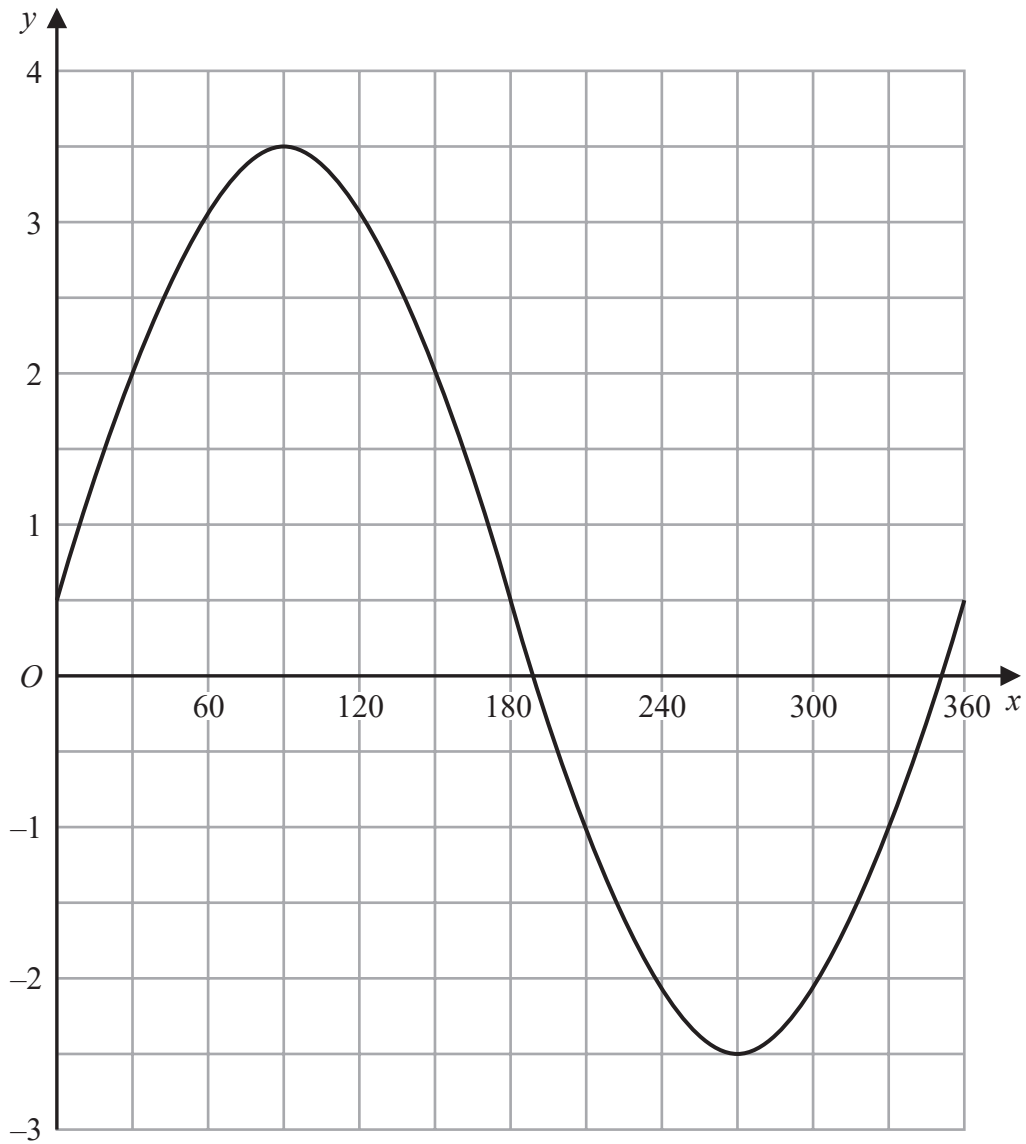
(Total for Question 23 is 5 marks)

Turn over for Question 24



P 7 2 4 4 3 A 0 2 3 2 8

24 The graph of $y = a \sin x^\circ + b$ is drawn on the grid.



Find the value of a and the value of b

$a = \dots\dots\dots$

$b = \dots\dots\dots$

(Total for Question 24 is 2 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



DO NOT WRITE IN THIS AREA

25 The function f is such that $f(x) = 3x^2 - 12x + 7$ where $x \leq 2$

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

$f^{-1}(x) = \dots\dots\dots$

(Total for Question 25 is 4 marks)



26 Find the values of n such that

$$\frac{10^{4n} \times 2^{3(n^2-5n)} \times 5^{2(1-2n)}}{20^2} = 1$$

Show clear algebraic working.

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

