

“Mind Your Maths” **Answers 3**

Year 10 Exam Revision

Answer 1

(i) $a = 43^\circ$ (ii) $b = 43^\circ$ (iii) $c = 137^\circ$

[3 marks]

Answer 2

(i) $x < 18$

(ii) $x \geq 4$

(iii) $x > 3$

(iv) $x \leq \frac{1}{2}$

[1, 2, 2, 3 marks]

Answer 3

$x = 61 \cos 22 \therefore x = 56.6^\circ$

[3 marks]

Answer 4

(i) $c = y - mx$

(ii) $c = \sqrt{\frac{E}{m}}$

(iii) $c = \frac{5(f - 32)}{9}$

[1, 2, 2 marks]

Answer 5

(i)
$$\begin{aligned} \text{Area } \Delta &= \frac{1}{2} ab \sin C \\ &= \frac{1}{2} \times 6.5 \times 14.3 \times \sin 42 \\ &= 31.1 \text{ cm}^2 \end{aligned}$$

[2 marks]

(ii)
$$\begin{aligned} c^2 &= a^2 + b^2 - 2ab \cos C \\ &= 6.5^2 + 14.3^2 - 2 \times 6.5 \times 14.3 \times \cos 42 \\ &= 108.59 \\ &= 10.4 \text{ cm} \end{aligned}$$

[3 marks]

Answer 6

$420\,000 \times 1.12 = \text{£}470\,400$

[2 marks]

Answer 7

$$\text{Area Trapezium} = \frac{1}{2} (a + b) h$$

$$1000 = \frac{1}{2} (2x + 3x) x$$

$$1000 \times 2 = 5x^2$$

$$x^2 = 400$$

$$x = 20 \text{ cm}$$

[4 marks]

Answer 8

$$\begin{aligned} (5 - 3\sqrt{2})(5 + 4\sqrt{2}) &= 25 + 20\sqrt{2} - 15\sqrt{2} - 24 \\ &= 1 + 5\sqrt{2} \end{aligned}$$

That is, $a = 1$ and $b = 5$

[3 marks]

Answer 9

(i) $d = k\sqrt{h}$

$$10 = k\sqrt{4} \quad \Rightarrow k = 5 \text{ and the formula is } d = 5\sqrt{h}$$

[3 marks]

(ii) $d = 5\sqrt{h}$

$$35 = 5\sqrt{h}$$

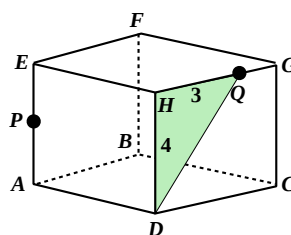
$$\sqrt{h} = 7$$

$$h = 49 \text{ metres}$$

[2 marks]

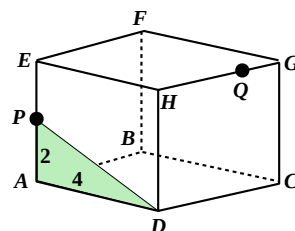
Answer 10

(i) $DQ = \sqrt{3^2 + 4^2} = 5 \text{ cm}$



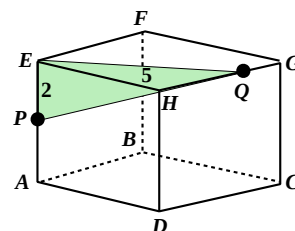
[2 marks]

(ii) $PD = \sqrt{2^2 + 4^2} = \sqrt{20} = 4.47 \text{ cm}$



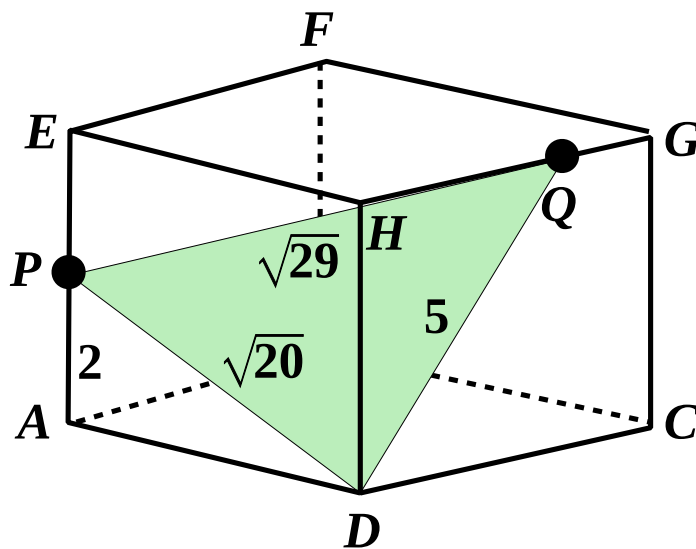
[3 marks]

(iii) $PQ = \sqrt{2^2 + 5^2} = \sqrt{29} = 5.39 \text{ cm}$



[3 marks]

(iv)



$$\cos D = \frac{p^2 + q^2 - d^2}{2pq} \quad (\text{The cosine rule reversed})$$

$$\begin{aligned} \cos QDP &= \frac{25 + 20 - 29}{2 \times 5 \times \sqrt{20}} \\ &= 0.358 \end{aligned}$$

$$\therefore \angle QDP = 69^\circ$$

[4 marks]

Answer 11**(i)**

Car speed (miles per hour, mph)	Number of cars Frequency = Area	Width	Height
$0 \leq m < 20$	100	20	5
$20 \leq m < 28$	160	8	20
$28 \leq m < 32$	400	4	100
$32 \leq m < 36$	160	4	40
$36 \leq m < 48$	180	12	15
$48 \leq m < 56$	40	8	5

[3 marks]**(ii)** 1040 cars**[1 mark]**

(iii) $\frac{400}{1040} \times 100 = 38.5 \%$

[2 marks]**Answer 12**

$$4x + 9y = 5 \Rightarrow \times 3 \Rightarrow 12x + 27y = 15$$

$$6x - 15y = -2 \Rightarrow \times 2 \Rightarrow 12x - 30y = -4$$

$$57y = 19$$

$$y = \frac{1}{3}$$

Use y to find x, $4x + 9y = 5$

$$4x + 3 = 5$$

$$4x = 2$$

$$x = \frac{1}{2}$$

[4 marks]