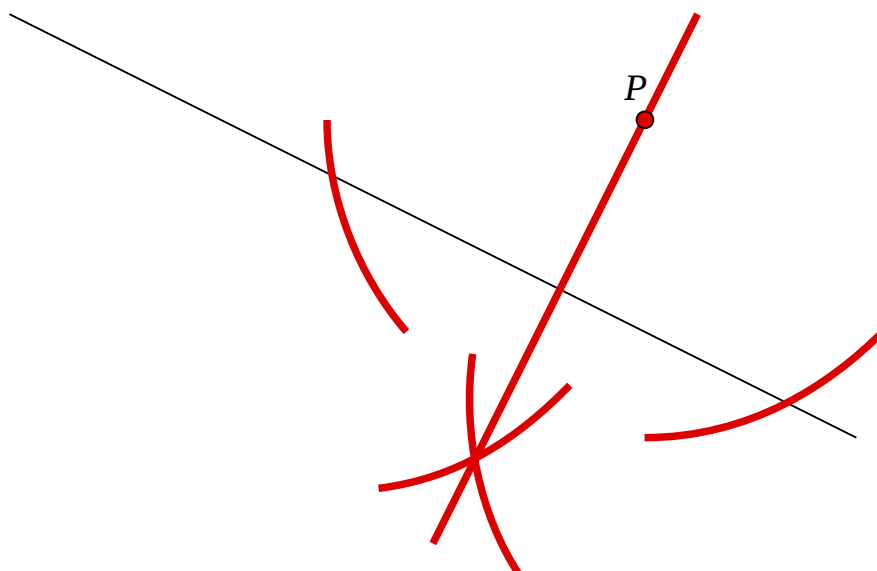


“Mind Your Maths” **Answers 4**

Year 10 Exam Revision

Answer 1



[3 marks]

Answer 2

- (i) If the number 3 were allowed into function g a division by zero would result.
Division by zero has no meaning in mathematics.

[1 mark]

(ii)
$$\begin{aligned} fg(5) &= f\left(\frac{1}{2}\right) \\ &= \left(\frac{1}{2}\right)^2 + 1 \\ &= \frac{5}{4} \end{aligned}$$

[3 marks]

Answer 3

- (i) $x = 132^\circ$ (ii) $y = 66^\circ$

[2, 2 marks]

Answer 4

- (i) $0.7 \times £640 = £448$

[2 marks]

- (ii) $x \times 0.7 = 28.70 \quad \therefore x = £41$

[2 marks]

Answer 5**(i)** Use the cosine rule,

$$\begin{aligned}
 x^2 &= 15^2 + 23^2 - 2 \times 15 \times 23 \times \cos 58 \\
 &= 388.4 \\
 x &= 19.7 \text{ m}
 \end{aligned}$$

[3 marks]**(ii)** Use either the reversed cosine rule or the upside down sine rule,

$$\begin{aligned}
 \frac{\sin y}{15} &= \frac{\sin 58}{19.7} \\
 \sin y &= \frac{15 \times \sin 58}{19.7} \\
 &= 0.6457 \\
 y &= \arcsin 0.6457 \\
 &= 40.2^\circ
 \end{aligned}$$

[3 marks]**(iii)**

$$\begin{aligned}
 \text{Area } \Delta &= \frac{1}{2} \times 15 \times 23 \times \sin 58 \\
 &= 146 \text{ m}^2
 \end{aligned}$$

[2 marks]**Answer 6****(i)**

		Die					
		1	2	3	4	5	6
Spinner	2	1	0	1	2	3	4
	3	2	1	0	1	2	3
	5	4	3	2	1	0	1

[2 marks]

(ii) $\frac{6}{18} = \frac{1}{3}$

(iii) $\frac{8}{18} = \frac{4}{9}$

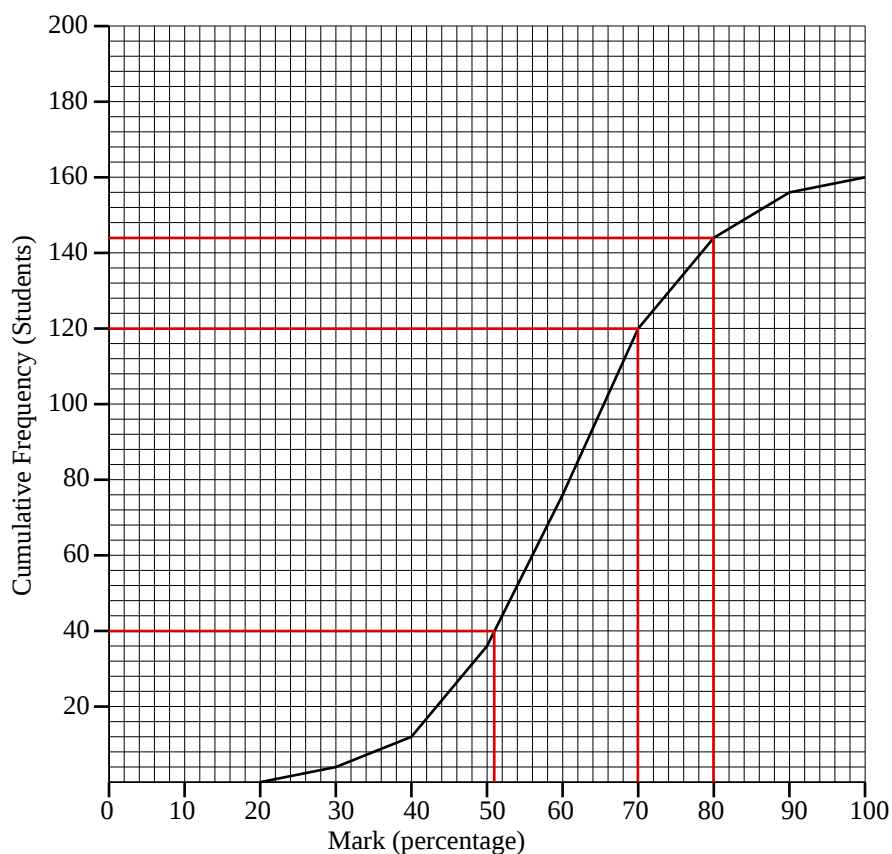
[2, 2 marks]

Answer 7

(i) $LSF = \frac{36}{24} = \frac{3}{2}$ width (larger) $= 9 \times \frac{3}{2} = 13.5 \text{ cm}$

[2 marks]

(ii) $VSF = \left(\frac{3}{2}\right)^3 = \frac{27}{8}$ volume (smaller) $= 9477 \times \frac{8}{27} = 2808 \text{ cm}^3$

[3 marks]**Answer 8**

(i) $160 - 144 = 16$ students

Accept $14 \leq \text{Ans} \leq 20$ **[2 marks]**

(ii) There needs to be lines drawn on the graph, such as those in red on the graph above from 40 and 120 on the Cumulative Frequency axis.

$$IQR = 70 - 51$$

$$= 19 \text{ students}$$

Accept $16 \leq \text{Ans} \leq 24$ **[3 marks]**

Answer 9

$$(i) \quad |\overrightarrow{BD}| = \sqrt{20^2 - 16^2} \quad (\text{Pythagoras' Theorem})$$

$$= 12 \text{ metres}$$

$$|\overrightarrow{AB}| = \sqrt{37^2 - 12^2} \quad (\text{Pythagoras' Theorem})$$

$$= 35 \text{ metres}$$

$$\therefore |\overrightarrow{AC}| = 35 + 16$$

$$= 51 \text{ metres}$$

[5 marks]

$$(ii) \quad \text{Area} = \frac{1}{2} \times 51 \times 12$$

$$= 306 \text{ m}^2$$

[2 marks]

$$(iii) \quad \angle BCD = \arcsin\left(\frac{16}{20}\right)$$

$$= 53.1^\circ$$

[2 marks]**Answer 10**

$$(i) \quad E = \frac{k}{d^3} \quad \Rightarrow 75 = \frac{k}{2^3} \Rightarrow k = 600$$

$$\therefore \text{The formula sought is, } E = \frac{600}{d^3}$$

[3 marks]

$$(ii) \quad E = \frac{600}{4^3} = 9.375 \text{ volts/metre}$$

[2 marks]

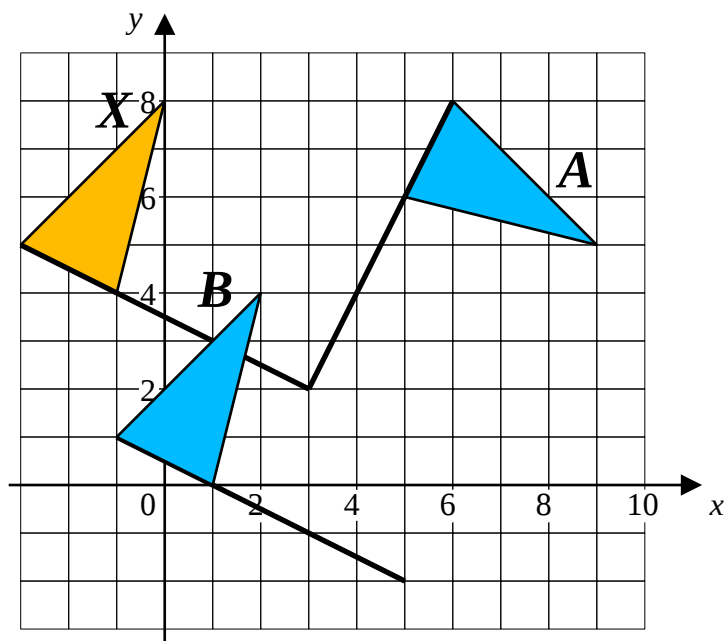
$$(iii) \quad 0.4 = \frac{600}{d^3} \Rightarrow d^3 = \frac{600}{0.4} = 1500$$

$$d = 11.4 \text{ metres}$$

[2 marks]

Answer 11

(i)



[2 marks]

(ii) Rotation
by 90° (anticlockwise)
about (6, 1)

[3 marks]