

“Mind Your Maths” **Answers 5**

Year 10 Exam Revision

Answer 1

$$f(x) = \sqrt[3]{4x - 1}, \quad x \in \mathbb{R}$$

(i) $ff(86) = f(7) = 3$

[3 marks]

(ii) $f(x) = 11$

$$\sqrt[3]{4x - 1} = 11$$

$$4x - 1 = 1331$$

$$4x = 1332$$

$$x = 333$$

[3 marks]

Answer 2

(i) $(3m + 6)(m + 7) = 3m^2 + 21m + 6m + 42$
 $= 3m^2 + 27m + 42$

[2 marks]

(ii) $(3w - 5)^2 = (3w - 5)(3w - 5)$
 $= 9w^2 - 15w - 15w + 25$
 $= 9w^2 - 30w + 25$

[3 marks]

Answer 3

(i) $\cos C = \frac{a^2 + b^2 - c^2}{2ab}$

[2 marks]

(ii) $\cos C = \frac{15.5^2 + 9.1^2 - 12.7^2}{2 \times 15.5 \times 9.1} = 0.5734$

$$c = \arccos 0.5734 = 55.0^\circ$$

[3 marks]

(iii) $\text{Area } \Delta = \frac{1}{2} ab \sin C$

[2 marks]

(iv) $\text{Area } \Delta = \frac{1}{2} \times 15.5 \times 9.1 \times \sin 55.0$
 $= 57.8 \text{ cm}^2$

[3 marks]

Answer 4

(i) $x^2 + 6x + 8 = (x + 4)(x + 2)$

[2 marks]

(ii) $2x^2 + 11x + 12 = (2x + 3)(x + 4)$

[2 marks]

Answer 5

(i) Jill is correct.

[1 mark]

(ii) For a fixed constant distance, k , the formula becomes,

$$Speed = \frac{k}{Time}$$

which is what inverse proportion looks like.

Or you could argue that travelling a certain fixed distance with more speed takes less time. The “more is less” is a hallmark of inverse proportion.

[1 mark]

(iii) It will take half the time.

[1 mark]

Answer 6

A loss of 21.8% is the same as keeping 78.2%.

$$325000 \times \frac{78.2}{100} = £254150$$

[2 marks]

Answer 7

(i) $Distance = Speed \times Time$

[2 marks]

(ii) $v = u + at$

$$v - u = at$$

$$t = \frac{v - u}{a}$$

[2 marks]

(iii) $A = \frac{1}{2}xy \sin Z$

$$\sin Z = \frac{2A}{xy}$$

[2 marks]

(iv) $c = ax + bx$
 $c = x(a + b)$
 $x = \frac{c}{a + b}$

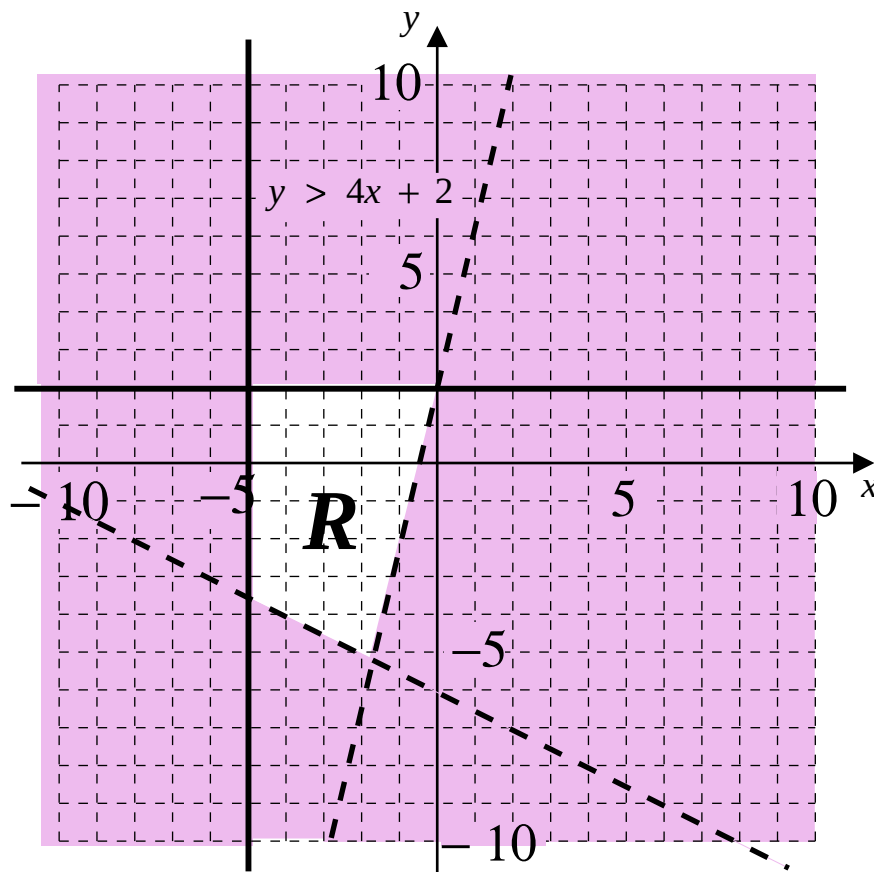
[2 marks]

Answer 8

$$\begin{aligned}a^2 &= b^2 + c^2 - 2bc \cos A \\&= 17^2 + 13^2 - 2 \times 17 \times 13 \cos 35 \\&= 95.93 \quad \therefore a = 9.79 \text{ cm}\end{aligned}$$

[3 marks]

Answer 9



[7 marks]

Answer 10

(i) 49 (ii) $\frac{1}{4}$

[2, 2 marks]

Answer 11

(i)
$$\begin{aligned}\text{Area} &= \frac{1}{2} (A + B) D + \frac{1}{2} (B + C) D \\&= \frac{AD}{2} + \frac{BD}{2} + \frac{BD}{2} + \frac{CD}{2} = \frac{D}{2} (A + 2B + C)\end{aligned}$$

(ii) 1080

[4, 4 marks]

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