

Brief Answers to Grade Grabber 4

Answer 1

- (i) $2a + 2b$
- (ii) $-2a + b$
- (iii) $-b - a$
- (iv) $k = -2$ because $2a + 2b = (-2)(-b - a)$
- (v) they are parallel

[1, 1, 1, 2, 1 marks]

Answer 2

- (i) 0.45 m^3
- (ii) 5103 kg
- (iii) 5.103 tonnes
- (iv) No !

[4 marks]

Answer 3

- (i) $A = \{ 1, 2, 4, 8, 16 \}$
- (ii) $B = \{ 1, 2, 4, 5, 10, 20 \}$
- (iii) $A \cap B = \{ 1, 2, 4 \}$
- (iv) $A \cup B = \{ 1, 2, 4, 5, 8, 10, 16, 20 \}$
- (v) $A' \cap B = \{ 5, 10, 20 \}$
- (vi) $A \cap B' = \{ 8, 16 \}$
- (vii) $(A' \cap B) \cap (A \cap B') = \emptyset$

Mr Fussy

Mr Greedy

the part of B that's not in A

the part of A that's not in B

empty set

[7 marks]

Answer 4

- (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

[2 marks]

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

[2 marks]

Answer 5

$$x \times 0.8 = 320 \quad \therefore x = \text{£}400$$

[2 marks]**Answer 6**

$$y = 4x^3 + 5x^{0.5}$$

$$\frac{dy}{dx} = 12x^2 + 2.5x^{-0.5}$$

[3 marks]**Answer 7**

$$\frac{x^2 - 2x - 24}{x^2 - 6^2} = \frac{(x - 6)(x + 4)}{(x - 6)(x + 6)}$$

$$= \frac{x + 4}{x + 6}$$

[2 marks]**Answer 8**

$$x^2 + y^2 = 100$$

$$(3y - 10)^2 + y^2 = 100$$

$$9y^2 - 60y + 100 + y^2 = 100$$

$$10y^2 - 60y = 0$$

Divide through by 10

$$y^2 - 6y = 0$$

$$y(y - 6) = 0$$

Either $y = 0$ or $y = 6$

Points are, $(-10, 0)$, $(8, 6)$

[5 marks]**Answer 9****(i)** Note that the radius is 0.3 cm

$$V = \pi r^2 h$$

$$= 3.14 \times 0.3^2 \times 15$$

$$= 4.24 \text{ cm}^3$$

(ii) Geek method :

$$V_{LOST} = \frac{2}{3} \times 3.14 \times 0.3^2 \times 2$$

$$= 0.38 \text{ cm}^3$$

[4 marks]

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