

21 Today #2
Brief Answers

GCSE Mathematics
Twenty-One Today

Answer 1

$$fg(2) = f(11) = 61$$

[1 mark]

Answer 2

(i) 62° (ii) 8°

[1, 1 marks]

Answer 3

$$4(3x + 2) - 3(2x + 1) = 29$$

$$12x + 8 - 6x - 3 = 29$$

$$6x = 24$$

$$x = 4$$

[2 marks]

Answer 4

(i) $-5 < 4x + 3 \leq 13$

$$-8 < 4x \leq 10$$

$$-2 < x \leq 2.5$$

[2 marks]

(ii) $x = -1, 0, 1, 2$

[1 mark]

Answer 5

$$3.15 \times 10^{-6}$$

[1 mark]

Answer 6

$$0.6 \times 425 = \text{£}255$$

[1 mark]

Answer 7

$$45$$

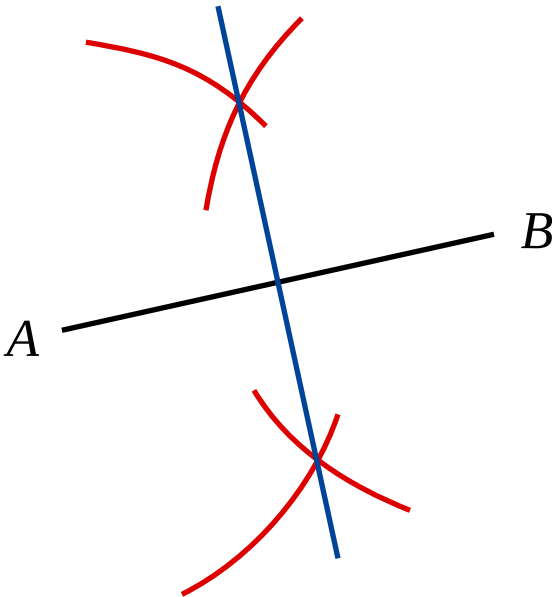
[1 mark]

Answer 8

$$c = \sqrt{\frac{E}{m}}$$

[1 mark]

Answer 9



[3 marks]

Answer 10

Time	N° of Customers (frequency)	Cumulative Frequency
$0 < t \leq 5$	8	8
$5 < t \leq 10$	11	19
$10 < t \leq 15$	23	42
$15 < t \leq 20$	42	84
$20 < t \leq 25$	9	93
$25 < t \leq 30$	5	98
$30 < t \leq 35$	2	100

[1 mark]

Answer 11

$$\begin{aligned}(3x + 4)(2x - 3) &= 6x^2 - 9x + 8x - 12 \\ &= 6x^2 - x - 12\end{aligned}$$

[1 mark]

Answer 12

81300

[1 mark]

Answer 13

(i) 129 cm² (ii) 3220 cm³

[1, 1 marks]

Answer 14

$$\begin{aligned}
 \overrightarrow{DE} &= \overrightarrow{DB} + \overrightarrow{BE} \\
 &= \frac{3}{5} \overrightarrow{OB} + \frac{1}{5} \overrightarrow{BC} \\
 &= \frac{3}{5} (\overrightarrow{OA} + \overrightarrow{AB}) + \frac{1}{5} (\overrightarrow{BA} + \overrightarrow{AO} + \overrightarrow{OC}) \\
 &= \frac{3}{5} (\mathbf{a} + \mathbf{b}) + \frac{1}{5} (-\mathbf{b} - \mathbf{a} + 3\mathbf{b}) \\
 &= \frac{3}{5} \mathbf{a} + \frac{3}{5} \mathbf{b} - \frac{1}{5} \mathbf{b} - \frac{1}{5} \mathbf{a} + \frac{3}{5} \mathbf{b} \\
 &= \frac{2}{5} \mathbf{a} + \mathbf{b}
 \end{aligned}$$

[4 marks]

Answer 15

(i) 1, 3, 9

[1 mark]

(ii) The most obvious answer is 16 which has 5 factors.
Other answers include, 27 (4 factors) and 32 (6 factors)

[1 mark]

Answer 16

All possible prime rolls are indicated on the following diagram,

		RED					
		1	2	3	4	5	6
B L U E	1						
	2		P	P		P	
	3		P	P		P	
	4						
	5		P	P		P	
	6						

$$p(\text{prime roll}) = \frac{9}{36} = \frac{1}{4}$$

[3 marks]

Answer 17

$$u = \arctan\left(\frac{74.4}{92.3}\right) = 38.9^\circ$$

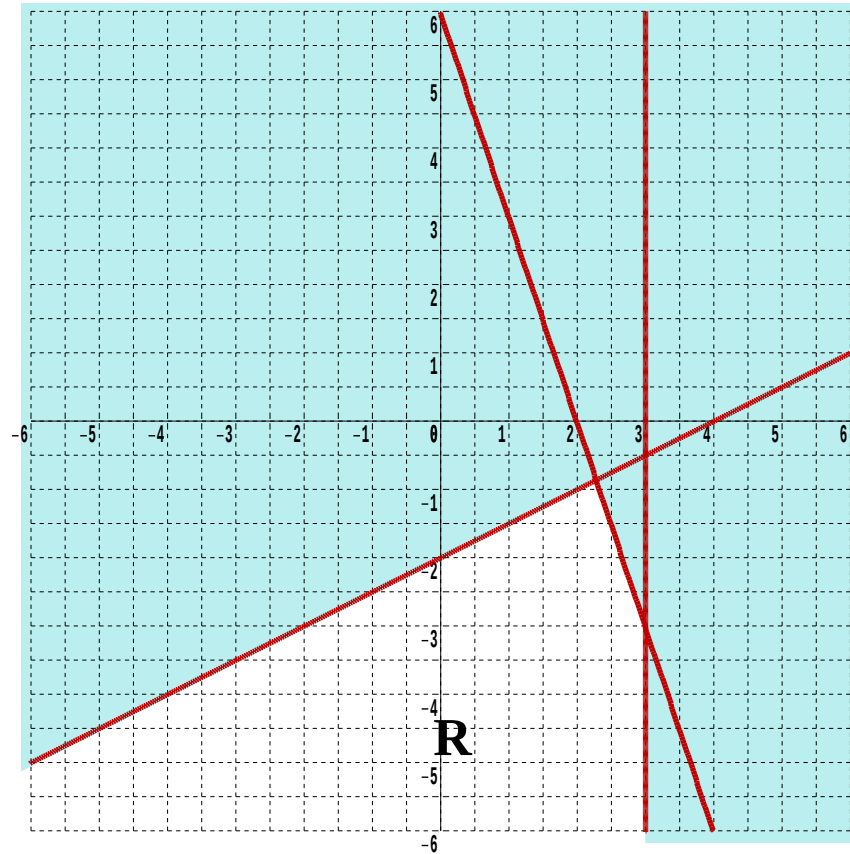
[2 marks]

Answer 18

$$(3x)^2 \times (2x)^3 = 9x^2 \times 8x^3 = 72x^5$$

[2 marks]

Answer 19



[3 marks]

Answer 20

$$x^2 + 3x - 28 = 0$$

$$(x + 7)(x - 4) = 0$$

Either $x = -7$ or $x = 4$

[2 marks]

Answer 21

$$50^2 = 2500$$

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Teachers may obtain detailed worked solutions to the exercises by email from MHHShrewsbury@Gmail.com