Answers to Grade Grabber 12

Answer 1

$$\begin{aligned}(x+4)(x-3)(x+3) &= (x+4)(x^2-9)\\ &= x^3+4x^2-9x-36\end{aligned}$$

[3 marks]

Answer 2

$$24e^4g+32e^3g^5 = 8e^3g(3e+4g^4)$$

[2 marks]

Answer 3

$$\begin{aligned}\textit{Average Speed} &= \frac{\textit{Total Distance}}{\textit{Total Time}}\\ &= \frac{264}{2.75}\\ &= 96 \text{ km h}^{-1}\end{aligned}$$

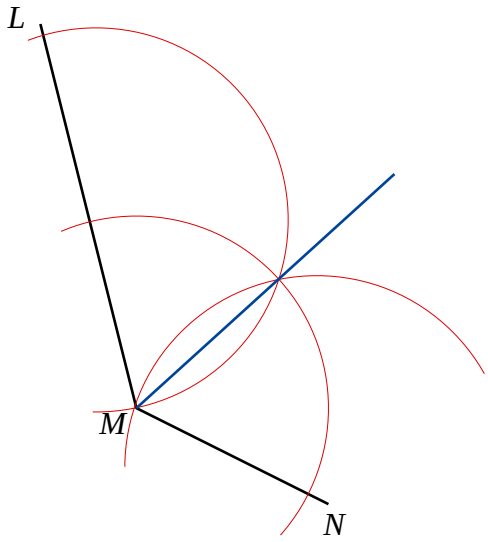
[3 marks]

Answer 4

$$\begin{aligned}\text{LHS} &= 2-(x-2)\div\left(\frac{x^2-4}{2x+3}\right)\\ &= 2-(x-2)\times\frac{2x+3}{x^2-4}\\ &= 2-\frac{(x-2)(2x+3)}{(x-2)(x+2)}\\ &= 2-\frac{(2x+3)}{(x+2)}\\ &= \frac{2(x+2)-(2x+3)}{(x+2)}\\ &= \frac{2x+4-2x-3}{x+2}\\ &= \frac{1}{x+2}\\ &= \text{RHS as it's of the form } \frac{a}{x+b} \text{ with } a=1,\ b=2\end{aligned}$$

[5 marks]

Answer 5



[3 marks]

Answer 6

$$x^2 - 3x - 18 = 0$$

$$(x + 3)(x - 6) = 0$$

Either $x = -3$ or $x = 6$

[3 marks]

Answer 7

2 parts must be £26

$2 \times £13 \ : \ 5 \times £13 \ : \ 3 \times £13$

Total is, $10 \times £13 = £130$

[4 marks]

Answer 8

(i)

$$(5x + 2)(2x + 1) = 60$$

$$10x^2 + 9x + 2 = 60$$

$$10x^2 + 9x - 58 = 0 \qquad \square$$

[3 marks]

$$(10x + 29)(x - 2) = 0$$

As a length cannot be negative, $x = 2$ is the only valid solution

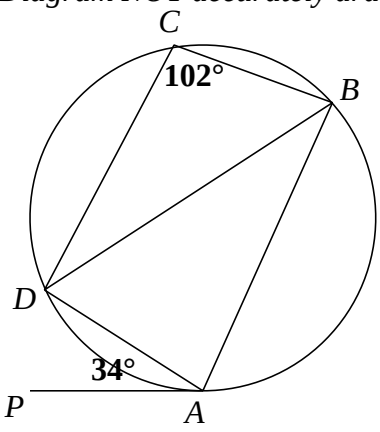
$$Area\ lawn = 10 \times 4$$

$$= 40\ m^2$$

[4 marks]

Answer 9

Diagram NOT accurately drawn



$\angle DAB = 78°$ as opposite sides in cyclic quadrilateral $ABCD$ sum to 180°

$\angle ABD = 34°$ alternate angle theorem

$\angle ADB = 68°$ angles in a triangle sum to 180°

[5 marks]

Answer 10

$$y = 28x^2 + \frac{7}{x}$$

$$= 28x^2 + 7x^{-1}$$

$$\frac{dy}{dx} = 56x - 7x^{-2}$$

For a stationary point, $\frac{dy}{dx} = 0$

$$56x - 7x^{-2} = 0$$

Multiply through by x^2

$$56x^3 - 7 = 0$$

$$x^3 = \frac{7}{56}$$

$$= \frac{1}{8}$$

$$x = \frac{1}{2} \qquad \text{Point is } \left(\frac{1}{2},\ 21\right)$$

[5 marks]