

1. Make  $g$  the subject of the formula

$$T = \sqrt{\frac{g+6}{2}}$$

← having  $g$  in a  $\sqrt{\quad}$  will make it difficult to isolate, so we need to eliminate the square root by squaring both sides of the expression  
 $(\sqrt{a})^2 = a$

$$\begin{aligned} T^2 &= \frac{g+6}{2} && \textcircled{1} \\ \times 2 & \left( \begin{array}{l} T^2 = \frac{g+6}{2} \\ 2T^2 = g+6 \end{array} \right) \times 2 && \textcircled{1} \\ -6 & \left( \begin{array}{l} 2T^2 = g+6 \\ 2T^2 - 6 = g \end{array} \right) -6 && = 0 \end{aligned}$$

U ✓  
YAY

$$g = 2T^2 - 6 \quad \textcircled{1}$$

(Total for Question is 3 marks)

$$\frac{3^4 \times 3^{-2}}{3^8}$$

$$= \frac{3^{4-2}}{3^8}$$

$$= \frac{3^2}{3^8}$$

$$= 3^{2-8}$$

$$= 3^{-6}$$

$$= \frac{1}{3^6}$$

$$a^x \times a^y = a^{x+y}$$

$$\frac{a^x}{a^y} = a^{x-y}$$

$$9$$

2.  $v^2 = u^2 + 2as$

$$u = 12 \quad a = -3 \quad s = 18$$

(a) Work out a value of  $v$ .

$$v^2 = (12)^2 + 2(-3)(18)$$

$$v^2 = 144 + 2(-54)$$

$$v^2 = 144 - 108$$

$$v^2 = 36$$

$$\sqrt{\quad} \quad \sqrt{\quad}$$

$$v = \pm 6$$

$$\pm 6$$

(2)

(b) Make  $s$  the subject of  $v^2 = u^2 + 2as$

$$v^2 = u^2 + 2as$$

$$(-u^2) \quad (-u^2)$$

$$v^2 - u^2 = 2as$$

$$(\div 2a) \quad (\div 2a)$$

$$\frac{v^2 - u^2}{2a} = s$$

$$s = \frac{v^2 - u^2}{2a}$$

(2)

(Total for Question is 4 marks)

3.  $T = 3x + 4y$

(a) Work out the value of  $T$  when  $x = 5$  and  $y = -7$ 

$$\begin{aligned} T &= 3(5) + 4(-7) \quad \checkmark_1 \\ &= 15 - 28 \\ &= -13 \end{aligned}$$

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$$-13 \quad \checkmark_2$$

(2)

(b) Work out the value of  $y$  when  $T = 38$  and  $x = 6$ 

$$\begin{aligned} T &= 3x + 4y \\ 38 &= 3(6) + 4y \\ 38 &= 18 + 4y \quad \checkmark_1 \\ -18 \downarrow & \quad \downarrow -18 \\ 20 &= 4y \quad \downarrow \div 4 \\ \div 4 \downarrow & \quad \downarrow \div 4 \\ y &= \frac{20}{4} = 5 \end{aligned}$$

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$$5 \quad \checkmark_2$$

(2)

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(Total for Question is 4 marks)