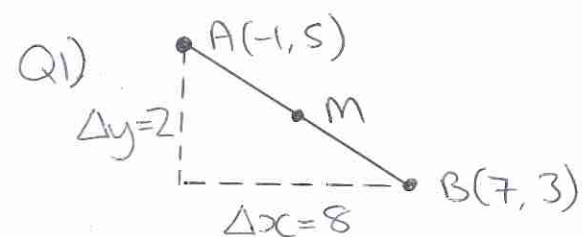


Y10 F/MATHS REVISION: ANSWERS



a) length $AB = \sqrt{\Delta x^2 + \Delta y^2} = \sqrt{8^2 + 2^2}$
 $= \sqrt{68} = \underline{2\sqrt{17}}$

b) $M(\frac{1}{2}(\text{sum of } x), \frac{1}{2}(\text{sum of } y))$
 $= (\frac{1}{2}(6), \frac{1}{2}(8)) = \underline{(3, 4)}$

c) $\text{grad}^t = \Delta y / \Delta x = -2/8 = \underline{-1/4}$

d) perpendicular has $\text{grad}^t = -1 / (-1/4) = \underline{+4}$

Q2) $y = 2x + 1 \Rightarrow \text{grad}^t = +2 \Rightarrow \text{subs } m = 2$
 $(3, 4) \Rightarrow \text{subs } x = 3, y = 4$

$y = mx + c$
 $4 = 2(3) + c$
 $\Rightarrow 4 = 6 + c$
 $\Rightarrow c = -2$

so $y = \underline{2x - 2}$

Q3a) $a : b = 5 : 4 \Rightarrow \frac{a}{b} = \frac{5}{4} \Rightarrow \underline{a = \frac{5}{4}b}$

b) $3a + b = b \Rightarrow \frac{15}{4}b + b = b \Rightarrow \frac{19}{4}b = b \Rightarrow \frac{19}{4} = 1 \Rightarrow \underline{19 = 4}$

Q4a) $250 \times (0.9)^8 = \underline{\pounds 107.62}$

b) $250 = 0.8 \text{ of original} \Rightarrow \text{original} = 250 \div 0.8 = \underline{\pounds 312.50}$

c) $\frac{260 - 250}{250} \times 100 = \frac{10}{250} \times 100 = \underline{4\%}$

Q5) $x = 0.141414\dots$

$100x = 14.1414\dots$

$99x = 14$

$\Rightarrow \underline{x = 14/99}$

Q6a) $\sqrt{48} = \underline{4\sqrt{3}}$

b) $4\sqrt{3} + 2\sqrt{3} = \underline{6\sqrt{3}}$

c) $(2 + \sqrt{3})(5 - \sqrt{3}) = 10 - 2\sqrt{3} + 5\sqrt{3} - (\sqrt{3})^2 = \underline{7 + 3\sqrt{3}}$

Q7a) $\frac{4x^3y^2}{20x^2y^4} = \underline{\frac{x}{5y^2}}$

b) $\frac{x^2 - 9}{x + 3} = \frac{(x + 3)(x - 3)}{x + 3} = \underline{x - 3}$

$$Q7c) \frac{5}{x+2} + \frac{3}{2x} = \frac{5(2x) + 3(x+2)}{2x(x+2)} = \frac{13x+6}{2x(x+2)}$$

$$d) \frac{3}{4x} \times \frac{2x^3}{9} = \frac{6x^3}{36x} = \frac{x^2}{6}$$

$$e) \frac{8}{5x} \div \frac{x^3}{15} = \frac{8}{5x} \times \frac{15}{x^3} = \frac{120}{5x^4} = \frac{24}{x^4}$$

$$Q8a) 2, 10, 18, 26 \dots = \underline{\underline{8n-6}}$$

$$b) 2, 10, 22, 38 \dots$$

$$\begin{array}{cccc} \underbrace{+8} & \underbrace{+12} & \underbrace{+16} & \\ 2 & 10 & 22 & 38 \end{array}$$

$$\begin{array}{cccc} \underbrace{+4} & \underbrace{+4} & & \\ 2 & 10 & 22 & 38 \end{array}$$

$$\Rightarrow 2n^2 = n^2 = 1, 4, 9, 16, \dots$$

$$2n^2 = 2, 8, 18, 32, \dots$$

$$\begin{array}{cccc} 2 & 10 & 22 & 38 \\ 2 & 8 & 18 & 32 \\ \hline 0 & 2 & 4 & 6 \end{array}$$

$$\Rightarrow 2n-2$$

$$\begin{array}{c} \underbrace{+2} \\ 0 \\ 2 \\ 4 \\ 6 \end{array}$$

$$\text{so } n^{\text{th}} \text{ term is } \underline{\underline{2n^2+2n-2}}$$

$$Q9a) \frac{2n-1}{n+3} = 1.72 \Rightarrow 2n-1 = (n+3)1.72$$

$$\Rightarrow 2n-1 = 1.72n + 5.16$$

$$\Rightarrow 0.28n = 6.16$$

$$\Rightarrow n = \frac{6.16}{0.28}$$

$$\Rightarrow \underline{\underline{n=22}}$$

$$b) \text{ as } n \rightarrow \infty, \left. \begin{array}{l} 2n-1 \rightarrow 2n \\ n+3 \rightarrow n \end{array} \right\} \frac{2n-1}{n+3} \rightarrow \frac{2n}{n} = \underline{\underline{2}}$$

$$Q10) 10-3x > 2 \Rightarrow 8 > 3x \Rightarrow \frac{8}{3} > x \Rightarrow 2.666\dots > x$$

Largest integer value of x is 2

$$Q11a) -4 < p < 2, 3 < q < 6$$

$$\left. \begin{array}{l} (p-q)_{\min} = p_{\min} - q_{\max} \\ = -4 - 6 = -10 \end{array} \right\}$$

$$\left. \begin{array}{l} (p-q)_{\max} = p_{\max} - q_{\min} \\ = 2 - 3 = -1 \end{array} \right\}$$

$$\underline{\underline{-10 < p-q < -1}}$$

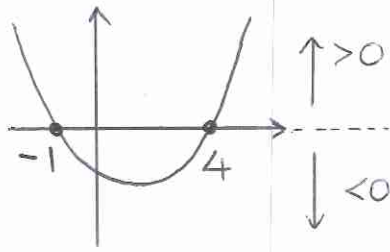
$$Q11b) (pq)_{\min} = p_{\min} \times q_{\min} = -4 \times 3 = -12$$

$$(pq)_{\max} = p_{\max} \times q_{\max} = 2 \times 6 = 12$$

$$\underline{\underline{-12 < pq < 12}}$$

$$Q12) x^2 - 3x - 4 \leq 0 \Rightarrow (x-4)(x+1) \leq 0$$

$x=4$ & $x=-1$ are solutions



$$\text{solution is: } \underline{\underline{-1 \leq x \leq 4}}$$

$$Q13) y = \frac{2+x}{3-x} \Rightarrow y(3-x) = 2+x$$

$$\Rightarrow 3y - xy = 2+x$$

$$\Rightarrow 3y - 2 = x + xy$$

$$\Rightarrow 3y - 2 = x(1+y)$$

$$\Rightarrow \underline{\underline{\frac{3y-2}{1+y} = x}}$$

$$\text{OR } \frac{3y-2}{y+1} = x$$

$$Q14) \underline{(x+3)(x-2)}(2x+1) = (x^2 - 2x + 3x - 6)(2x+1)$$

$$= (x^2 + x - 6)(2x+1)$$

$$= 2x^3 + x^2 + 2x^2 + x - 12x - 6$$

$$= \underline{\underline{2x^3 + 3x^2 - 11x - 6}}$$

$$Q15a) 3x + 4y = 10 \xrightarrow{\times 2} 6x + 8y = 20 \quad \ominus$$

$$2x + 5y = 23 \xrightarrow{\times 3} \underline{6x + 15y = 69}$$

$$\underline{\underline{-7y = -49}} \Rightarrow \underline{\underline{y = 7}}$$

$$3x + 4(7) = 10 \Rightarrow 3x + 28 = 10$$

$$\Rightarrow 3x = -18 \Rightarrow \underline{\underline{x = -6}}$$

$$\left(\text{Check: } 2x + 5y = 2(-6) + 5(7) = -12 + 35 = 23 \checkmark \right)$$

Q15b)

$$y - x = 1 \Rightarrow y = x + 1$$

$$\Rightarrow y^2 = (x + 1)^2 = x^2 + 2x + 1$$

$$x^2 + y^2 = 5 \Rightarrow x^2 + (x^2 + 2x + 1) = 5$$

$$\Rightarrow 2x^2 + 2x - 4 = 0$$

$$\Rightarrow x^2 + x - 2 = 0$$

$$\Rightarrow (x - 1)(x + 2) = 0$$

$$x = 1 \text{ \& } x = -2$$

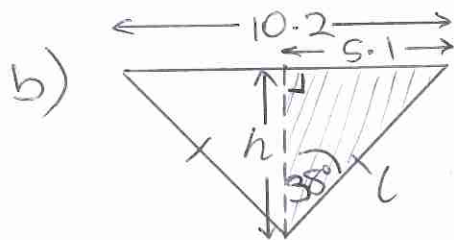
$$\underline{x=1} \Rightarrow y = x + 1 \Rightarrow \underline{y=2}$$

$$\underline{x=-2} \Rightarrow y = x + 1 \Rightarrow \underline{y=-1}$$

Q16a) $A = \frac{1}{2} ab \sin C$

$$= \frac{1}{2} \times 6.2 \times 4.7 \times \sin 71$$

$$= \underline{\underline{13.8 \text{ cm}^2}}$$



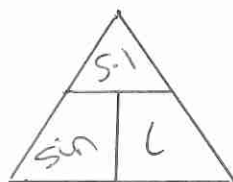
$$\Rightarrow h = \frac{5.1}{\tan 38}$$

$$h = 6.5277$$

$$A = 2 \times \left(\frac{1}{2} \times 5.1 \times 6.5277 \right)$$

$$A = \underline{\underline{33.3 \text{ cm}^2}}$$

OR



$$\Rightarrow L = \frac{5.1}{\sin 38}$$

$$L = 8.28377$$

$$A = \frac{1}{2} \times L \times L \times \sin 76$$

$$= \frac{1}{2} \times 8.28377^2 \times \sin 76$$

$$= 33.3 \text{ cm}^2$$