

Year 2 Term 2 Class test (2)

Q1a) $y = 2x^2 + 10x + 8$

① U-shape

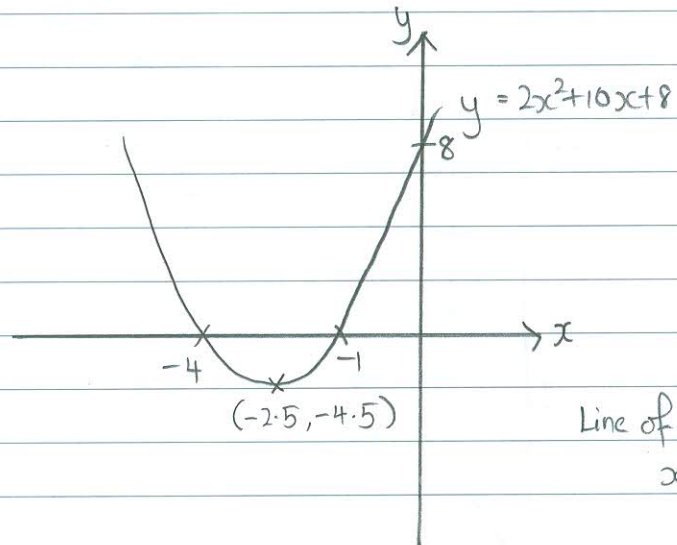
② $2x^2 + 10x + 8 = 0$

$2(x^2 + 5x + 4) = 0$

$2(x+1)(x+4) = 0$

$x = -1 \text{ or } -4$

③ y-intercept = 8

④ T-P = $(-2.5, -4.5)$ Line of symmetry:
 $x = -2.5$ #

b) $y = -x^2 + 8x - 12$

① n-shape

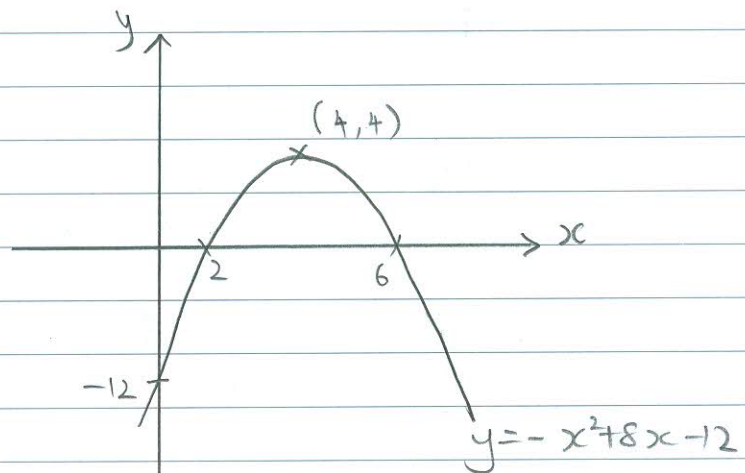
② $-x^2 + 8x - 12 = 0$

$x^2 - 8x + 12 = 0$

$(x-6)(x-2) = 0$

$x = 2 \text{ or } 6$

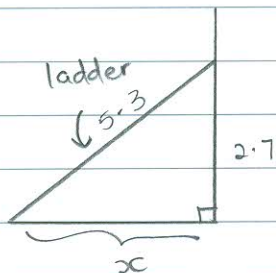
③ y-intercept = -12

④ T-P = $(4, 4)$ 

Q2) $y = x^2$
 $\Rightarrow y = (x-2)^2$
 $\Rightarrow y = (x-2)^2 - 5$ #

Line of symmetry:
 $x = 4$ #

Q3)



$x^2 = 5.3^2 - 2.7^2$

$x = 4.5607$

$\approx 4.56 \text{ m}$ #

Q4)

$a = \sqrt{2} \dots \therefore x = 1 + (\sqrt{5})^2$

$b = \sqrt{3} \dots = \sqrt{6}$

$c = \sqrt{4} \dots = 2.4494 \dots$

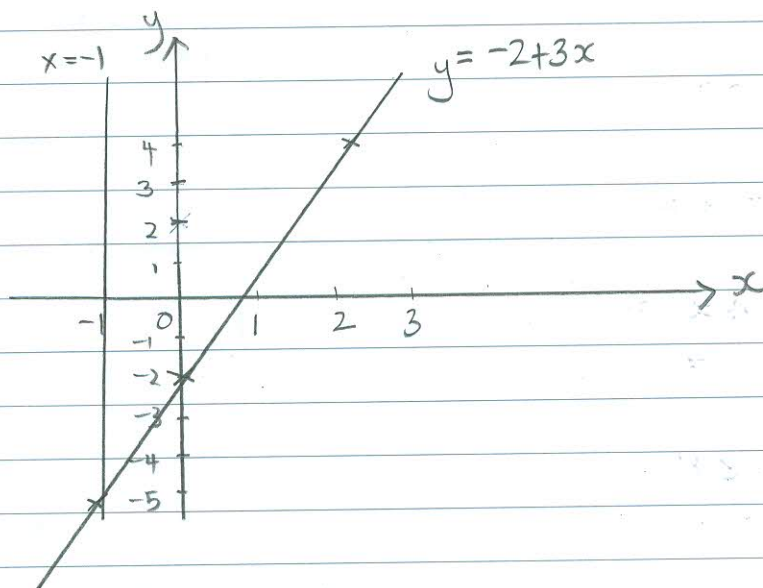
$d = \sqrt{5} \dots \approx 2.45 \text{ units}$

Q5 i)

$$y = -2 + 3x$$

when $x = -1$, $a = -2 + 3(-1)$
 $a = -5$ #

cii)



Scale: 1 cm to 1 unit (x-axis)
 0.5 cm to 1 unit (y-axis)

(iii)

$$(-1, -5) \#$$

Q6a)

$$2x - 5y = 35$$

when $x = 0$, $-5y = 35$
 $y = -7 \Rightarrow B \text{ is } (0, -7) \#$

when $y = 0$, $2x = 35$
 $x = 17.5 \Rightarrow A \text{ is } (17.5, 0) \#$

b)

$$\text{Area} = \frac{1}{2} \times 7 \times 17.5$$

$$= 61.25 \text{ units}^2 \#$$

c)

$$\text{length of } AB^2 = 17.5^2 + 7^2$$

$$AB = 18.848 \dots$$

$$\approx 18.8 \text{ units} \#$$

Q7a)

$$\left(\frac{x^{3n} y^{n-2}}{x^{n+1} y} \right)^2 = (x^{2n-1} y^{n-3})^2$$

$$= x^{4n-2} y^{2n-6} \#$$

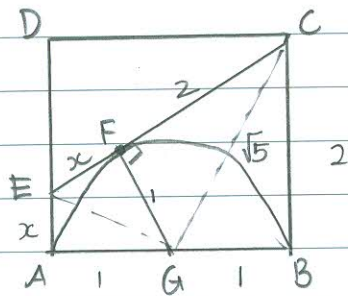
$$\begin{aligned} \text{Q7b)} \quad \frac{(p^2 q^4)^{\frac{1}{2}} \times \sqrt[3]{q^6}}{p q^{-1}} &= \frac{p q^2 \times q^2}{p q^{-1}} \\ &= q^5 \# \end{aligned}$$

$$\begin{aligned} \text{Q8)} \quad 2^{2x+1} \times 16^x \div 4^{x-1} &= 64 \\ 2^{2x+1} \times 2^{4x} \div 2^{2x-2} &= 2^6 \\ 2x+1+4x-2x+2 &= 6 \\ 4x+3 &= 6 \\ 4x &= 3 \\ x &= \frac{3}{4} \# \end{aligned}$$

$$\begin{aligned} \text{Q9)} \quad \text{length}^2 &= 20^2 + 30^2 + 50^2 \\ \text{length} &= 10\sqrt{38} \text{ or } 61.644\dots \\ &\approx 61.6 \text{ cm} \# \end{aligned}$$

$$\begin{aligned} \text{Q10)} \quad \text{Diagonal of Square} &= \sqrt{4^2 + 4^2} \\ \text{Radius} &= \frac{\sqrt{4^2 + 4^2} - 4}{2} \\ &= -2 + 2\sqrt{2} \text{ or } 0.828 \text{ cm} \# \end{aligned}$$

Bonus



$$\angle EGC = 90^\circ$$

Let EF be x , $FC = 2 \text{ cm}$

$$GC = \sqrt{5} \text{ cm}$$

$$EG^2 = 1 + x^2$$

\therefore using $\triangle ECG$,

$$1 + x^2 = (2 + x)^2 - 5$$

$$1 + x^2 = 4 + 4x + x^2 - 5$$

$$4x = 2$$

$$x = 0.5 \text{ cm}$$

$$\therefore EC = 2 + 0.5$$

$$= 2.5 \text{ cm} \#$$