1.4 Since $f(x)=mx+b$

Q13 and $\lim_{x\to 1} f(x) = -2$ and $\lim_{x\to -1} f(x) = 4$

$\therefore$ $(1,-2)$ and $(-1,4)$ are on the line.

So $m = \frac{6}{-2}$ and $\frac{x-1}{1} = \frac{y+2}{-3}$

$= -3$ $\therefore$ $y = -3x+1$ ITRE

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Q14 $f(x) = ax^2+bx+c$

- $f(0) = 0 \longrightarrow c = 0$

- $\lim_{x\to 1} f(x) = 5 \longrightarrow f(1)=5$

$\longrightarrow a(1)^2+b(1)=5$

$\longrightarrow a+b=5$ ①

- $\lim_{x\to -2} f(x) = 8 \longrightarrow f(-2)=8$

$\longrightarrow a(-2)^2+b(-2)=8$

$\longrightarrow 4a-2b=8$

$\longrightarrow 2a-b=4$ ②

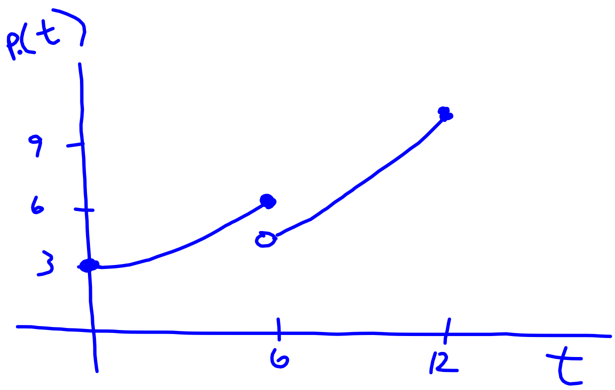
① + ② $\rightarrow$ $3a=9$ $\therefore$ $b=2$ $\therefore$ $y=3x^2+2x$ ITRE

$a=3$

Q15

$$p(t) = \begin{cases} 3 + \frac{1}{12}t^2, & 0 \le t \le 6 \\ 2 + \frac{1}{18}t^2, & 6 < t \le 12 \end{cases}$$

(a)




| $t$ | $p(t)$ |
|---|---|
| 0 | 3 |
| 6 | 6 |
| $6^+$ | 4 |
| 12 | 10 |

(b) $\lim\limits_{t \to 6^-} p(t) = 6$ and $\lim\limits_{t \to 6^+} p(t) = 4$

(c) $6 - 4 = 2$, $\therefore$ 2000 fish were killed by the spill

(d) $2 + \frac{1}{18}t^2 = 6$ $\qquad t^2 = 4(18)$

$\frac{t^2}{18} = 4$ $\qquad t = (2)(3)\sqrt{2}$

$= 6\sqrt{2}$

$\doteq 8.4$ years