Exercise 1A

1) $$Y = 1.2 + 0.4X$$

a) Relationship of form $y = ax^n$

$$\log y = 1.2 + 0.4 \log x$$

$$y = ax^n$$

$$\log y = \log ax^n$$

$$\log y = \log a + \log x^n$$

$$\log y = \log a + n \log x$$

$n = 0.4$ $\quad \log a = 1.2 \Rightarrow a = 10^{1.2}$

$a = 15.85$

$$\underline{y = 15.85x^{0.4}}$$

3) Line through $(0, 172)$ and $(23, 109)$

$$m = \frac{109 - 172}{23 - 0} = -\frac{63}{23}$$

$$y = -\frac{63}{23}x + c$$

sub $(0, 172)$ $\quad 172 = 0 + c$

$$\underline{y = -\frac{63}{23}x + 172}$$

$$\log y = n \log x + \log a$$

$$\Rightarrow \quad n = -\frac{63}{23} = -2.739$$

$$\log a = 172 \quad = \quad a = 10^{172}$$

$$y = 10^{172} x^{-2.739}$$