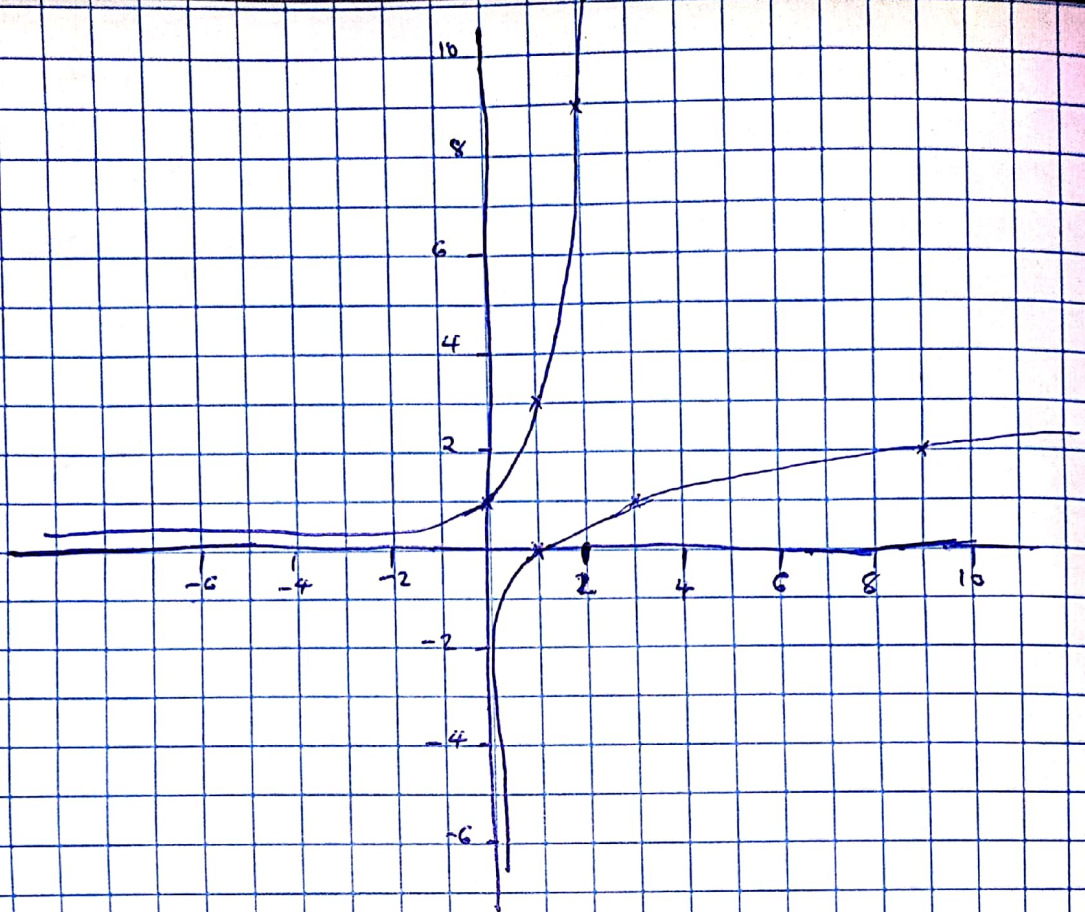


4(a)



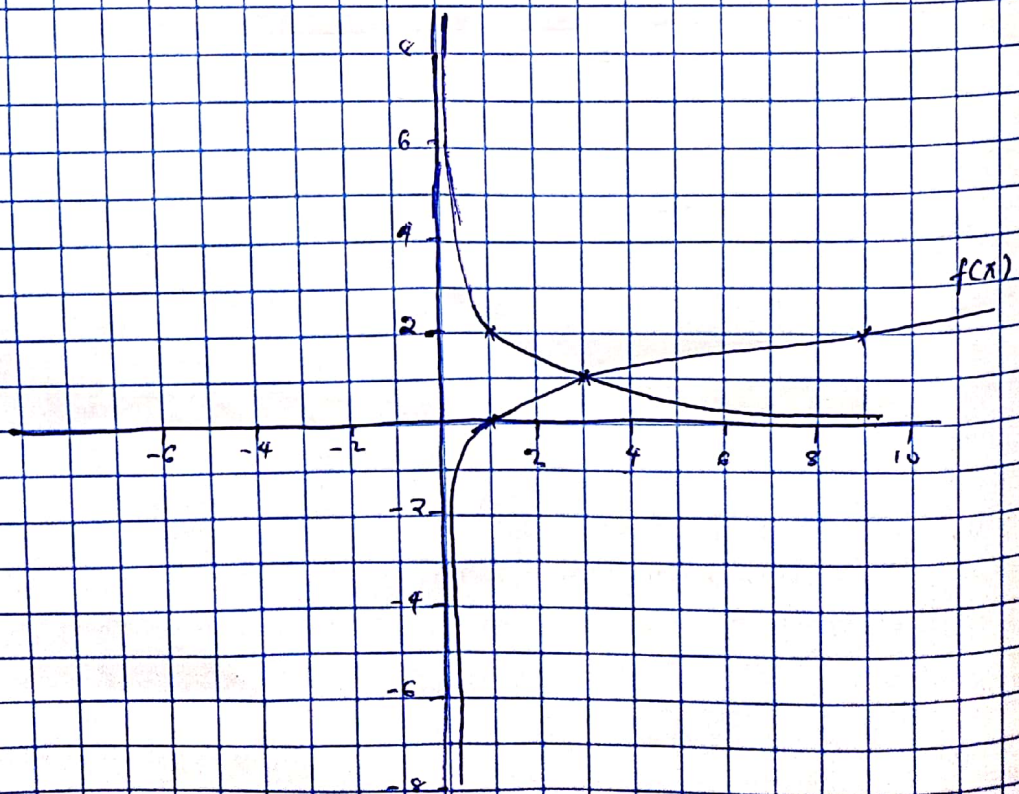
(b) $f(x) = \log_3 x$

$g(x) = -\log_3 x + 2$

(i) Reflect $f(x)$ along the x -axis.

(ii) Then shift $f(x)$ 2 units upwards.

(c)



$$\text{Domain} = (0, \infty)$$

$$\text{Range} = (-\infty, \infty)$$

Vertical asymptote: $x = 0$

(d) 5. In 1960, magnitude 9
In 1994, magnitude 6.5

$$I_1 = 10^9$$

$$I_2 = 10^{6.5}$$

$$= \frac{I_1}{I_2} = \frac{10^9}{10^{6.5}} = 10^{2.5} = 316.2278$$

Earthquake in Chile is 316.2278 times stronger than in North Ridge.

6) pH scale

$$\text{Orange juice } [H^+] = 10^{-5.2}$$

$$\text{Milk } [H^+] = 10^{-7.4}$$

$$= \frac{10^{-5.2}}{10^{-7.4}} = 10^{2.2} = 158.489 \text{ times}$$

$$9. \quad t = 6$$

$$A = P(1+r)^t$$

$$2376.2 = P(1+r)^2$$

$$2823.15 = P(1+r)^4$$

$$\frac{2376.2}{2823.15} = \frac{P(1+r)^2}{P(1+r)^4}$$

$$0.84168 = (1+r)^{-2}$$

$$\ln(0.84168) = -2r$$

$$1+r = \frac{1}{\sqrt{0.84168}} = 1.08999$$

$$r = 1.08999 - 1 = 0.08999 = 8.999\%$$

$$10. P = 10 \log \left(\frac{I}{I_0} \right)$$

$$I_0 = 10^{-12} \text{ W/m}^2$$

$$P = 25 \text{ dB}$$

$$25 = 10 \log \left(\frac{I}{10^{-12}} \right)$$

$$2.5 = \log \left(\frac{I}{10^{-12}} \right)$$

$$10^{2.5} = \frac{I}{10^{-12}}$$

$$I = 10^{2.5} (10^{-12})$$

$$I = 10^{-9.5} \text{ W/m}^2$$