

$$\begin{aligned} \text{Q8} \quad & \begin{cases} 4x^2 + y^2 = 13 \\ x^2 + y^2 = 10 \end{cases} \Rightarrow 3x^2 = 3 \Rightarrow x^2 = 1 \Rightarrow \begin{cases} x = 1 \Rightarrow y^2 = 10 - 1^2 \Rightarrow y^2 = 9 \Rightarrow y = \pm 3 \\ \text{Hence 2 solutions: } (1, 3); (1, -3) \\ x = -1 \Rightarrow y^2 = 10 - (-1)^2 \Rightarrow y^2 = 9 \Rightarrow y = \pm 3 \\ \text{Hence 2 solutions: } (-1, 3); (-1, -3) \end{cases} \end{aligned}$$

Q9

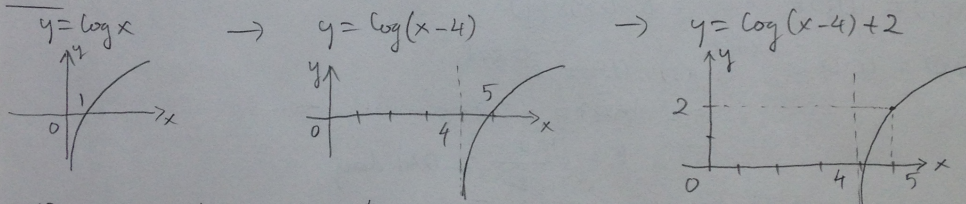
$$\begin{aligned} \text{a/} \quad & AC = \sqrt{(-1)^2 + (-9)^2} = \sqrt{82} \\ & BC = \sqrt{3^2 + (-3)^2} = \sqrt{18} \end{aligned} \quad \left\{ \Rightarrow B \text{ is closer to } C \text{ than } A. \right.$$

$$\begin{aligned} \text{b/} \quad & x^2 + y^2 + 4x + 2y - 20 = 0 \\ & (x^2 + 4x) + (y^2 + 2y) - 20 = 0 \Rightarrow (x+2)^2 + (y+1)^2 - 4 - 1 - 20 = 0 \\ & \Rightarrow (x+2)^2 + (y+1)^2 = 25 \Rightarrow \text{Center} = (-2, -1); R = 5 \end{aligned}$$

Q10

$$\begin{aligned} \text{a/} \quad & f(x) = \frac{2}{(2-x)^2} & \text{b/} \quad & g(x) = -\sqrt{x-3x^2} & \text{c/} \quad & h(x) = 3|x+1| - 3 \\ \text{D:} \quad & x \neq 2 & \text{D:} \quad & x - 3x^2 \geq 0 \Leftrightarrow x(1-3x) \geq 0 \\ & & \Rightarrow \text{D} = & [0, \frac{1}{3}] & \text{D:} \quad & \mathbb{R} \\ \text{Range:} \quad & (0, \infty) & \text{Range:} \quad & (-\infty, 0] & \text{Range:} \quad & [-3, \infty) \end{aligned}$$

Q11



$$\text{Q12} \quad f(x) = \frac{1}{x+2} \quad g(x) = \frac{4}{x-1}$$

$$\begin{aligned} \text{a/} \quad & fg = \frac{1}{x+2} \cdot \frac{4}{x-1} & \text{b/} \quad & \frac{f}{g} = \frac{1}{x+2} \cdot \frac{x-1}{4} & \text{c/} \quad & fog = \frac{1}{\frac{4}{x-1} + 2} & \text{d/} \quad & gof = \frac{4}{\frac{1}{x+2} - 1} \end{aligned}$$

$$\text{Q13} \quad f(x) = \frac{3x}{x+2}$$

$$\text{a/} \quad x = \frac{3y}{y+2} \Rightarrow x(y+2) = 3y \Rightarrow xy + 2x = 3y \Rightarrow xy - 3y = -2x \Rightarrow y = \frac{-2x}{x-3}$$

$$\text{b/} \quad \boxed{f(x)} \quad \text{HA: } y = 3 \\ \text{VA: } x = -2$$

$$\boxed{f^{-1}(x)} \quad \text{HA: } y = -2 \\ \text{VA: } x = 3$$