



Quiz 1 :

Q1) Fill in the blank :

1) The domain of $f(x) = \frac{1}{x-7}$

$$x-7=0$$

$$x=7$$

$$D_f = \mathbb{R} - \{7\} = (-\infty, 7) \cup (7, \infty)$$

2) range of $f(x) = 3 + \sqrt{x}$

$$x \geq 0$$

$$D_f = [0, +\infty)$$

$$\left\{ \begin{array}{l} \text{Range} \\ f(0) = 3 + \sqrt{0} = 3 \\ f(1) = 3 + \sqrt{1} = 4 \end{array} \right.$$

$$R_f = [3, +\infty)$$

3) $f(x) = \begin{cases} \frac{1}{x} & x > 3 \\ 2x & x \leq 3 \end{cases}$ then $f(\pi)$ is equal to

$$\pi = 3.14$$

$$f(\pi) = \frac{1}{3.14}$$

$$\text{Q4) } f(x) = x+5, g(x) = \sqrt{x}$$

$$\text{a) } (g \circ f)(x)$$

$$g(f(x)) = g(x+5) = \sqrt{x+5}$$

$$D_f = (-\infty, +\infty)$$

$$D_{\sqrt{x+5}} = x+5 \geq 0 = x \geq -5 = [-5, +\infty)$$

$$\begin{aligned} D_{g \circ f} &= D_f \cap D_{\sqrt{x+5}} = (-\infty, +\infty) \cap [-5, +\infty) \\ &= [-5, +\infty) \end{aligned}$$

$$\text{b) } f \circ g$$

$$D_{f \circ g} = D_f \cap D_g$$

$$D_f = (-\infty, +\infty)$$

$$D_g = [0, +\infty)$$

$$D_{f \circ g} = (-\infty, +\infty) \cap [0, +\infty) = [0, +\infty)$$

Q5) express f as Composition of two functions

$$f = g \circ h, f(x) = \sqrt{x-2}$$

$$h = x - 2, g = \sqrt{x}$$

$$g \circ h = g(x-2) = \sqrt{x-2}$$

Q6) even or odd function

$$f(x) = x + 3$$

$$f(-x) = -x + 3 \neq f(x) \rightarrow \text{not even}$$

$$f(-x) = -x + 3 \neq -f(x) = -x - 3 \neq -f(x)$$

not odd

neither

Q7) True or false :

1) let $f(x) = \sqrt{x+1} + 4$ then $f(8) = 6$ (X)

$$f(8) = \sqrt{8+1} + 4 = 3 + 4 = 7$$

2) $f(x) = 3x + 5$, $g(x) = x - 3$ then $f+g = 4x+2$ (✓)

$$f+g = 3x+5+x-3 = 4x+2$$

3) if $f(x) = x^7$ then $f(x)$ is odd function (✓)

4) $f(x)$ and $g(x)$ are discontinuous at $x = a$
then so $f(x) \cdot g(x)$ (X)

5) $\lim_{x \rightarrow a} f(x) = +\infty$ then $f(x)$ decreases function (X)