

FST 3-7 Extra Practice

$$f(x) = \frac{4}{x-2}$$

$$g(x) = \frac{3}{x}$$

1) Find $f \circ g$. State the domain. $f(g(x))$

Domain of $g(x)$ $x \neq 0$

$$f(g(x)) = \frac{4}{\frac{3}{x} - 2} \cdot \frac{x}{x} = \frac{4x}{3-2x}$$

$$\frac{4x}{3-2x} = f(g(x))$$

$$\begin{aligned} 3-2x &\neq 0 \\ -3 & \quad -3 \\ \hline -2x & + 3 \\ \hline x & \neq \frac{3}{2} \end{aligned}$$

$$D: \{x \mid x \neq 0, x \neq \frac{3}{2}\}$$

2) Find $g \circ f$. State the domain. $g(f(x))$

Domain of $f(x)$ $x-2 \neq 0$ $x \neq 2$
 $+2$ $+2$

$$g(f(x)) = \frac{3}{\frac{4}{x-2}} = \frac{3}{4} \cdot \frac{x-2}{1} = \frac{3x-6}{4} = g(f(x))$$

$$D: \{x \mid x \neq 2\}$$

$$D: \{x \mid x \in \mathbb{R}\}$$

$$f(x) = 2x + 3$$

$$D: \{x \mid x \in \mathbb{R}\}$$

$$g(x) = x^2 + 5$$

3) Find $f \circ g$. State the domain.

$$2(x^2 + 5) + 3$$

$$2x^2 + 10 + 3$$

$$2x^2 + 13$$

$$D: \{x \mid x \in \mathbb{R}\}$$

4) Find $g \circ f$. State the domain.

$$(2x + 3)^2 + 5$$

$$4x^2 + 12x + 9 + 5$$

$$4x^2 + 12x + 14$$

$$D: \{x \mid x \in \mathbb{R}\}$$

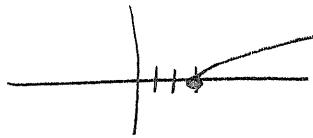
5) Find the domain of $y = \sqrt{x-3}$

$$x - 3 \geq 0$$

$$+3 \quad +3$$

$$x \geq 3$$

$$D: \{x \mid x \geq 3\}$$



6) Find the domain of $y = \frac{1}{\sqrt{x-3}}$

$$(\sqrt{x-3})^2 > (0)^2$$

$$x - 3 > 0$$

$$+3 \quad +3$$

$$x > 3$$

$$D: \{x \mid x > 3\}$$



$$7) f(x) = \frac{1}{x}$$

$$g(x) = \sqrt{x+4}$$

$$\text{Domain: } x + 4 \geq 0$$

$$-4 \quad -4$$

$$x \geq -4$$

Find $f \circ g$. State the domain.

$$\frac{1}{\sqrt{x+4}} = f \circ g$$

$$\text{Domain: } (\sqrt{x+4})^2 > (0)^2$$

$$x + 4 > 0$$

$$-4 \quad -4$$

$$x > -4$$

$$D: \{x \mid x > -4\}$$