

King Fahd University of Petroleum and Minerals

Prep-Year Math Program

Math 001 - Term 141

Recitation (2.8)

Question 1: If $f(x) = \frac{3x+2}{1-x}$ and $g(x) = \sqrt{x+2}$, find

(a): $(f-g)(-1)$ (b): $(g \circ f)\left(\frac{1}{2}\right)$ (c): Domain of: $\frac{g}{f}$

Ans: (a): $(f-g)(-1) = -\frac{3}{2}$ (b): $(g \circ f)\left(\frac{1}{2}\right) = 3$ (c): $D_{\frac{g}{f}} = \left[-2, -\frac{2}{3}\right) \cup \left(-\frac{2}{3}, 1\right) \cup (1, \infty)$

Question 2: If $(f \circ g)(x) = 8x^2 + 12x - 1$ and $f(x) = 4x - 5$, then find $g(-2)$.

Answer: $g(-2) = 3$

Question 3: If $f(x) = \begin{cases} 2x-3 & \text{if } x \leq -2 \\ 2x+3 & \text{if } x > -2 \end{cases}$ and $g(x) = \llbracket x \rrbracket$, find $(f \circ g)(0.85)$

Answer: $(f \circ g)(0.85) = 3$

Question 4: If $f(x) = \sqrt{2-x}$ and $g(x) = \sqrt{x+3}$, then the domain of $\left(\frac{f}{g}\right)(x)$ is

- a) $[-2, 3)$
- b) $(-3, \infty)$
- c) $[-3, 2]$
- d) $(-\infty, -3] \cup [2, \infty)$
- e) $(-\infty, -2] \cup [3, \infty)$

Answer: (c): $D_{\frac{f}{g}} = [-3, 2]$

Question 5: If $f(x) = \sqrt{x}$ and $g(x) = x^2 - 1$, then the domain of $(f \circ g)(x)$ is

- a) $[0, \infty)$
- b) $(-\infty, \infty)$
- c) $[-1, 0) \cup (0, 1]$
- d) $(-\infty, -1] \cup [1, \infty)$
- e) $[-1, \infty)$

Answer: (d): $D_{f \circ g} = (-\infty, -1] \cup [1, \infty)$