Northern Michigan University (Marquette Co, MI)

CS111-04-26W: College Algebra (Andrew A. Poe) Name: _____
Quiz 5 Wednesday 11 March 2026 2:00 P.M. EDT

Time: 15 minutes

1.

$f(x) = x^2 + 5$ $g(x) = 2x + 1$

Compute $f \circ g\,(x)$ and $g \circ f(x)$.

$f \circ g(x) = f(g(x)) = f(2x+1) = (2x+1)^2 + 5 = 4x^2 + 4x + 1 + 5 =$ $\boxed{4x^2 + 4x + 6}$

$g \circ f(x) = g(f(x)) = g(x^2+5) = 2(x^2+5)+1 = 2x^2 + 10 + 1 =$ $\boxed{2x^2 + 11}$

2. Compute the inverse of the following function.

$f(x) = \dfrac{x}{x-3}$

$y = \dfrac{x}{x-3}$ switch x and y

$x = \dfrac{y}{y-3}$ $x(y-3) = y$ $xy - 3x = y$

$xy - y = 3x$ $y(x-1) = 3x$

$y = \dfrac{3x}{x-1}$

$\boxed{f^{-1}(x) = \dfrac{3x}{x-1}}$

What is the domain of the original function? What is the domain of the inverse?

orig: Domain is $(-\infty, 3) \cup (3, \infty)$

inverse: Domain is $(-\infty, 1) \cup (1, \infty)$