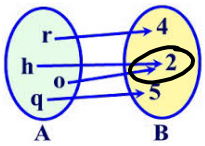
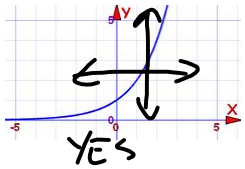
Quiz 1.4 to 1.7 Review Name: _____

Precalculus Period: _____ Date: _____

1. Determine if the following functions are one-to-one:



NO



YES

$g(x) = 5x^4 - 3x^3$

NO

2. Find the inverse relation of $f(x) = \frac{3x - 1}{2x + 4}$

Find the domain of $f^{-1}(x)$.

$y = \frac{3x-1}{2x+4}$

$(2y+4)x = \frac{3y-1}{2y+4}(2y+4)$

$2yx + 4x = 3y - 1$

$-4x \quad -4x$

$2yx = 3y - 1 - 4x$

$-3y \quad -3y$

$2yx - 3y = -1 - 4x$

$y(2x-3) = -1 - 4x$

$y = \frac{-1-4x}{2x-3}$

3. Determine if f(x) and g(x) are inverses using composition. $f(x) = x^3 + 1$ and $g(x) = \sqrt[3]{x^3 - 1}$

$f(g(x)) = (\sqrt[3]{x^3-1})^3 + 1$

$= x$ NO

$g(f(x)) = \sqrt[3]{(x^3+1)^3 - 1}$

$= x$

D: $(-\infty, \frac{3}{2}) \cup (\frac{3}{2}, \infty)$

$2x - 3 = 0$

$2x = 3$

$x = \frac{3}{2}$

4. Let $f(x) = 3x^2 - 2x$ and $g(x) = \sqrt{x+3}$ find:

a) (f∘g)(x) and give its domain. $(-\infty, \infty)$ $[-3, \infty)$

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

$3(x+3) - 2\sqrt{x+3}$

$3x + 9 - 2\sqrt{x+3}$

D: $[-3, \infty)$

b) f(f(x)) and give its domain.

$3(3x^2-2x)^2 - 2(3x^2-2x)$

$3(9x^4 - 12x^3 + 4x^2) - 6x^2 + 4x$

$27x^4 - 36x^3 + 12x^2 - 6x^2 + 4x$

$27x^4 - 36x^3 + 6x^2 + 4x$

D: $(-\infty, \infty)$

FOIL $(3x^2-2x)(3x^2-2x)$

$9x^4 - 6x^3 - 6x^3 + 4x^2$

$9x^4 - 12x^3 + 4x^2$

c) (g/f)(x) and give its domain.

$\frac{\sqrt{x+3}}{3x^2-2x}$ D: $[-3, \infty)$

$3x^2 - 2x \neq 0$

$x(3x-2) \neq 0$

$x \neq 0 \quad x \neq \frac{2}{3}$ D $[-3, 0) \cup (0, \frac{2}{3}) \cup (\frac{2}{3}, \infty)$

d) (g∘f)(-2)

$f(-2) = 3(-2)^2 - 2(-2) = 16$ $g(f(-2)) = \sqrt{16+3} = \sqrt{19}$

5. Write an equation whose graph can be obtained from the graph of $y = |x|$ by vertically compressing by a factor of 1/3, reflecting over the y-axis, horizontally shifting 2 units left and vertically shifting 7 units down.

$y = \frac{1}{3}|x|$

$y = \frac{1}{3}|-x|$

$y = \frac{1}{3}|-x-2|$

$y = \frac{1}{3}|-x-2| - 7$

$y = \frac{1}{3}|(-1)(x+2)| - 7$

6. Describe how the graph of $f(x) = (x - 2)^3$ can be transformed to the graph of $g(x) = -(x + 2)^3$

reflect x
4 left

7. Find two functions f(x) and g(x) such that g(f(x)) = y

$y = 2(x - 3)^2 - 4$

$f(x) = x - 3$

$g(x) = 2x^2 - 4$

8. Let $f(x) = 2\sqrt{x^2 + 3} - 4$. Find an equation for g, the reflection of f across the x-axis and y-axis.

x-axis $-(2\sqrt{x^2+3} - 4)$

$-2\sqrt{x^2+3} + 4$

y-axis $2\sqrt{(-x)^2+3} - 4$

$2\sqrt{x^2+3} - 4$

9. How many gallons of 40% acid solution must be added to 45 gallons of 20% acid solution to make a 25% mixed acidic solution?

mixed

$.4x + .2(45) = .25(x+45)$

$.4x + 9 = .25x + 11.25$

$-.2x \quad -9 \quad -.25x \quad -9$

$.15x = 2.25$

$x = 15$ gallons

$x = 15$ gallons

10. Mr. Mustache received an inheritance of x dollars. He put it in a CD that earned 5% annual interest and an additional 0.5% bonus yearly on the initial deposit.

a) Write a function relating the amount of money in the CD to the amount of his inheritance.

$f(x) = x + .05x + .005x$

b) If Mr. Mustache has $7385 at the end of the first year, how much did he invest?

$7385 = x + .05x + .005x$

$7385 = 1.055x$

$x = \$7000$