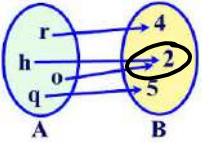


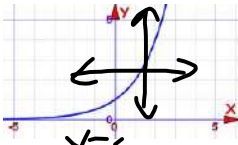
Quiz 1.4 to 1.7 Review
Precalculus

Name: _____
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 $f^{-1}(x)$.

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

$$(2y+4)x = \frac{3y-1}{2y+4} \quad \text{Find the domain of } f^{-1}(x).$$

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

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

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

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

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

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

$\neq X$ NO

Domain: $(-\infty, 3/2) \cup (3/2, \infty)$

$$2x - 3 = 0$$

$$2x = 3$$

$$x = 3/2$$

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

a) $(f \circ g)(x)$ and give its domain.

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

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

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: $(-\infty, \infty)$

c) $(g \circ f)(x)$ and give its domain.

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

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

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

$$x \neq 0 \quad x \neq 2/3 \quad D: [-3, 0] \cup (0, 2/3) \cup (2/3, \infty)$$

d) $(g \circ f)(-2)$

$$f(-2) = 3(-2)^2 - 2(-2) = 16$$

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

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.

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

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

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

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

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

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?

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

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

$$.15x = 2.25$$

$$x = 15 \text{ gal}$$

$x = 15 \text{ gallons}$

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?

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

$$7385 = 1.055x$$

$$x = \$7000$$

