Functions Test Questions:

1. There are exactly three real solutions to the equation

$$x^3 = 1 - x.$$

True or False

2. There are exactly three real solutions to the equation

$$3^x = 4x^2.$$

True or False

3. The range of the graph with equation

$$x^{2/3} + y^{2/3} = 4$$

is $-8 \leq y \leq 8$. True or False

4. If a sequence F_n is defined by

$$F_0 = 0, F_1 = 1, F_{n+2} = F_{n+1} + F_n, \text{ for } n \geq 0,$$

then $F_6 = 6$. True or False

5. The inverse of the function $f(x) = \dfrac{2x+3}{x-5}$ is $f^{-1}(x) =$

A. $\dfrac{5x+3}{x-2}$ B. $\dfrac{3x+5}{-x+2}$ C. $\dfrac{-3x+5}{x-2}$ D. $\dfrac{-5x+3}{x-2}$

6. The number of asymptotes to the graph of $f(x) = \dfrac{x^2+1}{x+1}$ is

A. 0 B. 1 C. 2 D. 3

7. If $g(x) = \dfrac{1}{x}$ and $h \neq 0$, then $\dfrac{g(x+h) - g(x)}{h} =$

A. $\dfrac{1}{x(x+h)}$ B. $\dfrac{-1}{x(x+h)}$ C. $\dfrac{1}{h^2}$ D. $\dfrac{-1}{h^2}$

8. Let $f(x) = 3x - 2$, let $g(x) = x^2 - 1$. Then $f(g(x)) =$

A. $9x^2 - 12x + 3$ B. $3x^2 - 5$ C. $3x^3 - 2x^2 - 3x + 2$ D. $x^{3x-2} - 1$

9. If $|2x - 4| \leq |x + 3|$, then

A. $-3 \leq x \leq 2$ B. $\dfrac{1}{3} \geq x \geq 7$ C. $x \leq 7$ D. $\dfrac{1}{3} \leq x \leq 7$