Name _____   College Pre-Calc

Final Exam Review #7

1. If $f(x) = 2x - 3$ and $g(x) = 8x^2 + 2x - 1$, find $(g \circ f)(x)$.

2. State the domain and range in interval notation for each of the following:
    a. $f(x) = -4|x| = 5$ b. $f(x) = 3x^2 - 4$

3. Find the quotient of: $5x^2 - 17x - 12$ by $x - 2$.

4. Simplify: $\dfrac{\frac{1}{x^2} - 1}{1 + \frac{1}{x}}$

5. Solve for all values of x: $81^{-3x+3} = \left(\frac{1}{243}\right)^{2x}$

6. Expand: $\log \dfrac{c\sqrt[3]{a}}{\sqrt{b}}$

7. Solve for all values of x: $\log_4 x + \log_4 (x+6) = 2$

8. Verify the identity: $\sec x - \tan x \sin x = \dfrac{1}{\sec x}$

9. A resultant force of 162 pounds must be exerted to move a refrigerator. If the two applies forces act on the refrigerator at angles of $44°$ and $39°$ with resultant, find the magnitude of each of the two applied forces to the nearest tenth of a pound.

10. Find the vertex form of the equation of the ellipse. Find its center, vertices and foci.
$$4x^2 + 5y^2 + 8x - 20y - 56 = 0$$

11. Find the value of k so that the function is continuous at the given value.

$$g(x) = \begin{cases} k\sqrt{x+1} & 0 \le x \le 3 \\ 5-x & 3 < x < 5 \end{cases} \quad at \quad x = 3$$

12. Determine the following limits algebraically:

    a. $\displaystyle\lim_{x\to 2} \frac{x^2+4x-12}{x^2-2x}$

    b. $\displaystyle\lim_{x\to 2} \frac{2-\sqrt{x+2}}{x-2}$

13. Find the partial fractions whose sum is: $\dfrac{7x+7}{x^2-3x-10}$

14. Find the area of a triangle using the determinant whose vertices are: (-2, 2), (1, 3), (3, 0).

15. Solve the system of equations by using elimination.

$$-x + 5y + z = -9$$
$$-6x - 3y + 4z = -21$$
$$-2x + 2y - 4z = -10$$