Math 2412 Pre-Calculus – Review Worksheet

Directions:
- Complete the following problems on separate paper.
- Show all of your work.
- No graphing calculators! You may use a scientific calculator.

Factor completely.

1. $2z^2 + 5z + 3$
2. $3x^2 - 12x - 36$
3. $x^3 + 27$
4. $x^3 + 3x^2 + 4x + 12$

Reduce the rational expression to lowest terms.

5. $\dfrac{8 - 2x}{x^2 - x - 12}$

Simplify the complex fraction.

6. $\dfrac{\frac{1}{2} + \frac{3}{x}}{\frac{x+3}{4}}$

Rationalize the denominator.

7. $\dfrac{1}{\sqrt{3}}$
8. $\dfrac{\sqrt{2}}{\sqrt{3} - \sqrt{2}}$

Determine which of the following relations represents a function. For each function, state the domain and range.

9. $\{(2,6), (-3,6), (4,9), (1,10)\}$
10. $\{(-2,4), (-2,6), (0,3), (3,7)\}$

Tell whether the set of ordered pairs (x, y) defined by each equation is a function. Explain your answer.

11. $y = x^3 - 3x$
12. $y = \dfrac{2}{x}$
13. $y^2 = 1 - x^2$
14. $y = \pm\sqrt{1 - 2x}$

For problems (#24) – (#26), find the following values for each function.

15. $f(x) = -2x^2 + x - 1$
16. $f(x) = \dfrac{x^2 - 1}{x + 4}$
17. $f(x) = \sqrt{x^2 + x}$

(a) $f(0)$ (b) $f(1)$ (c) $f(-1)$ (d) $f(-x)$ (e) $-f(x)$