Precalculus
Practice problems Sec. 3.4 – 3.6

NAME _____
MOD _____

Solve the inequality.

1) $(x + 3)(x + 1) > 0$ 1) _____

2) $x^2 - 49 > 0$ 2) _____

3) $x^3 - 4x^2 - 12x > 0$ 3) _____

4) $\frac{(x - 5)(x + 5)}{x} \leq 0$ 4) _____

5) $x + \frac{20}{x} < 9$ 5) _____

6) $\frac{(x - 3)^2}{x^2 - 36} > 0$ 6) _____

Solve the problem.

7) The revenue achieved by selling x graphing calculators is figured to be $x(40 - 0.5x)$ dollars. The cost of each calculator is \$20. How many graphing calculators must be sold to make a profit (revenue – cost) of at least \$187.50? 7) _____

Find the indicated intercept(s) of the graph of the function.

8) x-intercepts of $f(x) = \frac{x^2 - 9}{8 + x^4}$ 8) _____

9) y-intercept of $f(x) = \frac{(x - 2)^2}{(x + 11)^3}$ 9) _____

Analyze the graph of the rational function for the given step.

10) Find the vertical asymptote(s) and/or hole(s) for $R(x) = \frac{x^2 + x - 30}{x^2 - x - 42}$. 10) _____

Solve.

11) The amount of paint needed to cover the walls of a room varies jointly as the perimeter of the room and the height of the wall. If a room with a perimeter of 80 feet and 6-foot walls requires 4.8 quarts of paint, find the amount of paint needed to cover the walls of a room with a perimeter of 45 feet and 8-foot walls. 11) _____

Solve the problem.

12) The amount of time it takes a swimmer to swim a race is inversely proportional to the average speed of the swimmer. A swimmer finishes a race in 37.5 seconds with an average speed of 4 feet per second. Find the average speed of the swimmer if it takes 50 seconds to finish the race. 12) _____

13) A closed box with a square base has to have a volume of 8000 cubic inches. Find a function for the surface area of the box. 13) _____

List the potential rational zeros of the polynomial function. Do not find the zeros.

14) $f(x) = 6x^4 + 2x^3 - 3x^2 + 2$ 14) _____

Use the Factor Theorem to determine whether x - c is a factor of f. If it is, write f in factored form, that is, write f in the form f(x) = (x - c)(quotient).

15) $f(x) = 6x^3 + 15x^2 + 10x + 8; c = -2$ 15) _____

Find all of the real zeros of the polynomial function, then use the real zeros to factor f over the real numbers.

16) $f(x) = x^4 - 15x^2 - 16$ 16) _____

17) $f(x) = 3x^4 - 24x^3 + 49x^2 - 8x + 16$ 17) _____

Solve the equation in the real number system.

18) $2x^3 - x^2 + 2x - 1 = 0$ 18) _____