Chapter 5 Review Problems **Name _____**

Additional Problems: Pg. 396 – 397#1 – 4, 11 – 22, Graph 23 – 34, 35 – 50, 53, 54, 77 – 88

Determine the **zeros** and their **multiplicity** and whether they **cross** or **touch**.
Determine the **degree**, maximum number of **turning points**, **y-intercept**, and **limits**.
Then, **sketch** the graph of the function.

1. $f(x) = (x-4)^3(x+2)^2(x-2)$

2. $f(x) = -2x^3 + 4x^2$

Sketch the graph and solve the inequality. Give your answer interval notation.

3. $(x-3)(x^2-5x+6) < 0$

4. Determine if (x +2) is a factor of $f(x) = 2x^3 + 8x^2 - 5x + 5$.

5. What is the remainder when $x^9 + 3x^5 - 2x$ is divided by $x + 2$?

6. List the potential rational zeros of each function. Then, find all zeros for the function. Exact values!

   a. $f(x) = x^3 + 2x^2 - 7x - 14$

   b. $f(x) = x^4 + x^3 - 8x^2 + 4x - 48$

7. Write a polynomial function in standard form with rational coefficients which has the following zeros:

   -1 multiplicity 2 and 5 multiplicity 1 Degree: 3

8. Write a polynomial function in standard form with rational coefficients which has the following zeros:

   3 and $4 - i$ Degree: 3

9. $4i$ is a zero of $f(x) = x^4 - x^3 + 14x^2 - 16x - 32$, find the remaining zeros of the function.

10. Solve. Give solution(s) as exact value(s). Show all work!

    $4x^4 - 20x^3 + x^2 + 78x - 72 = 0$