***With your groups, determine all actual roots of the following equations.***

***After completing each step, check your work and take note of exactly what you did and why. Also take note of any challenges you encountered and how you handled them.***

***This will provide you with a nice study guide to use tonight!***

***Goal: Complete at least 4 problems in class, and the rest for homework.***

***(solutions are on the HW section of our website)***

\*Demonstrate understanding of the mathematics through: solving problems, predicting, explaining

\*Discuss various approaches \*Ask questions

\*Discuss possibilities \*Form hypotheses

\*Be organized and logical \*Use tools appropriately

\*Provide reasoning to support claims \*Express ideas clearly to one another

\*Work together as a team \*Equal and balanced input and participation

**Directions:** Complete all work on a clean sheet of paper.

For #1-4,

1. List all possible rational roots of each function.
2. Determine all actual roots of each function.

1. 2x4 - x3 – 24x2 – 20x + 16 = 0

2. 3x4 - 8x3 + 6x2 – 1 = 0

3. 2x3 + 2x2 - 2x + 30 = 0

4. 4x3 - 11x2 + 8x - 4 = 0

5. k and n are any real numbers, and p(x) = 2x6 – kx5 + nx2 – 10

Provide **two** reasons to support each answer.

1. Is it possible for 2x6 – kx5 + nx2 – 10 to have four imaginary roots and a real root of 4?
2. Is is possible for to have two imaginary roots, and real roots of x = -5, 2, -1, and ½?

6. What would be the first step in solving 6x8 – 5x3 + 2x2 – 9x = 0?

7. One root of f(x) = x4 – x3 - 11x2 + 9x + 18 is x = 3. Describe the next step in determining all roots.

**Practice your solving techniques!**

Solve each equation without using the rational root theorem.

8. 2x3 + 8x = x2 + 4 9. 16x3 – 54 = 0

10. x3 = -1000 11. x4 +51x2 = 4900

Solutions:

