Name _____

Rocket Number _____

INSTRUCTIONS: You must show enough work to justify your answer on **ALL** problems. Correct answers with no work (or inconsistent work) shown **will not** receive full credit. **All answers are to be exact; no decimal approximations.** You are **NOT** allowed to use any electronic device for this exam.

1. Simplify the following. Write your answer in $a + bi$ form. **Put a box around your answer.**

    a. $(-7 - 4i) + (2 - 6i)$ (5 pts.)

    b. $(4 - 3i)(5 + 9i)$ (5 pts.)

    c. $\dfrac{3 - 5i}{3 + 5i}$ (8 pts.)

2. Solve the following equations by the indicated method. **Put a box around your answer(s).**

    a. $16x^2 + 5 = 8$ using square roots (5 pts.)

b. $(y - 7)^2 = -36$ using square roots (5 pts.)

c. $x(3x + 8) = 4$ using the Quadratic Formula (10 pts.)

d. $3t^2 + 13t - 30 = 0$ by factoring (6 pts.)

3. Solve the following equations. **Put a box around your answer(s).**

   a. $6|2y + 9| - 7 = 11$ (8 pts.)

   b. $9x^3 - 45x^2 + 4x - 20 = 0$ (8 pts.)

c. $\dfrac{2y}{y+2} - \dfrac{3}{y-4} = \dfrac{y^2 - 10y}{y^2 - 2y - 8}$ (10 pts.)

d. $\sqrt{x-5} + x = 7$ (10 pts.)

4.   Solve the following inequalities. Write the solution set in interval notation.

a. $-2 < \dfrac{3x + 7}{4} \le 6$ (7 pts.)

Answer _____

b. $|y - 5| + 3 > 15$ (7 pts.)

Answer _____

5. Bill drove from his home to the beach last weekend. There was heavy traffic on the way there, and the trip took 5 hours. When Bill drove home, there was no traffic and the trip only took 3 hours. If his rate was 30 miles per hour faster on the trip home, how far away does Bill live from the beach? (7 pts)
Don't forget to identify any variable(s) that you use.

Answer _____