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. Simplify all radicals.

1.   Simplify the following. Write your answer in $a + b\,i$ form. **Put a box around your answer.**

a. $\dfrac{14 - \sqrt{-98}}{21}$ (5 pts.)

b. $(4 - 9i)^2$ (5 pts.)

c. $\dfrac{2 - 7i}{3 - 5i}$ (8 pts.)

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

a. $6y^2 + 24 = 0$ using square roots   (6 pts.)

b. $3(5x - 8)^2 + 4 = 52$ using square roots (6 pts.)

c. $3w^2 - 4w = 8$ using the Quadratic Formula (10 pts.)

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

a. $2t^5 = 54t^2$ (12 pts.)

b. $6|7x + 3| - 35 = -11$ (6 pts.)

c. $27 y^3 - 18 y^2 - 48 y + 32 = 0$ (8 pts.)

d. $\dfrac{5x}{2x - 3} - \dfrac{8}{x + 4} = \dfrac{2x^2 - 14x}{2x^2 + 5x - 12}$ (10 pts.)

e. $\sqrt{2y + 57} + 3 = y$ (10 pts.)

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

a. $-2 < \dfrac{5 - 9x}{11} \le 6$ (7 pts.)

Answer _____

b. $4|3y - 8| + 17 < 97$ (7 pts.)

Answer _____