Name:_____   Quadratics Ticket to Retake
                                        NO CALCULATORS THIS PART

Show all of your work on all problems to ensure you earn full credit.

For problems 1 – 8: Solve each of the following equations using the given method over the set of real and complex numbers.

Solve using square roots.

1. $-7 - 3(x + 2)^2 = -82$ 2. $4x^2 - 7 = -34$

Solve by factoring and then using the Zero Product Property.

3. $7x^2 - 27x - 4 = 0$ 4. $30x^2 + 42x - 36 = 0$

Solve by completing the square.

5. $x^2 + 10x - 77 = 0$ 6. $9x^2 + 18x + 48 = 40$

Solve by using the Quadratic Formula.

7. $4x^2 - 12x = -10$

8. $x^2 = -9x - 19$

9. Find all values of "k" so the given quadratic has 2 real solutions.
(Write your answer in interval notation.)

$4x^2 + k = 3x$

10. Write the equation of the parabola with a vertex of (1, -2) and that passes through (-1, 15).

For problems 11 -12: Simplify the square root expressions.

11. $-8\sqrt{288}$

12. $\sqrt{128} \cdot \sqrt{54}$

For problems 13 – 15: Find the vertex, axis of symmetry, a table of 5 points, the x – intercept(s), the y-intercept, domain and range using the given method and graph each of the following equations.

13. $y = -3(x + 5)^2 + 6$

Axis of Symmetry:_____

Vertex:_____

Domain:_____

Range:_____

Table:

x	y

y – intercept: _____

x – intercept(s): (Use the square root method)

_____ and _____

Graph:

14. $y = (x + 8)(x + 2)$

Axis of Symmetry:_____

Vertex:_____

Domain:_____

Range:_____

Table:

x	y

y – intercept: _____

x – intercept(s): (Use the Zero Product Prop.)

_____ and _____

Graph:

15. $y = 2x^2 + 8x - 2$

Axis of Symmetry:_____

Vertex:_____

Domain:_____

Range:_____

Table:

x	y

y – intercept: _____

x – intercept(s): (Use the Quadratic Formula)   _____ and _____

Graph:

For problems 16 - 20: Perform the indicated operations on the complex numbers.

16. $(2 + i) - (5 - 4i)$

17. $5i^3(4 - 9i)$

18. $(2 + 5i)(3 - 4i)$

19. $\dfrac{7 + 2i}{3 - 4i}$

20. i^{848}

For problem 21: Solve the inequality and express your answer graphically and using interval notation.

21. $(2x + 1)(5x - 7) \leq 0$

Show all of your work to ensure you earn full credit.

22. A contestant tosses a horseshoe from one pit to another with an initial velocity of 45 feet per second. The horseshoe is released 4 feet above the ground. (HINT: $h(t) = -16t^2 + v_o t + h_o$)

a. How long is the horseshoe in the air?

b. What is the maximum height the horseshoe reaches?

c. How high is the horse shoe after 0.5 seconds?

23. The floor of a one-story building is 14 feet longer than it is wide (see figure). The building has 2160 square feet of flooring space.

a. Write a quadratic equation for the area of the floor in terms of w.

b. Find the length and width of the floor.

w

$w + 14$