Quadratics Review

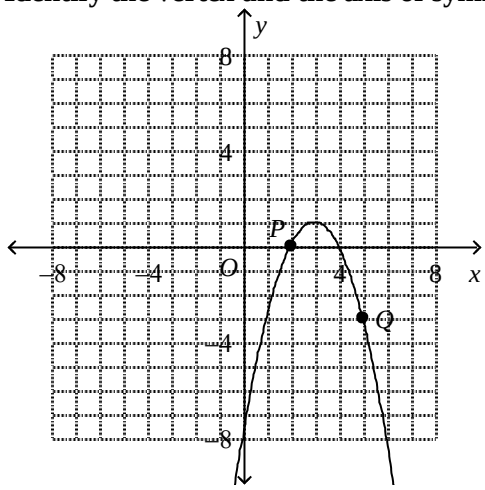
You must use a separate piece of paper, and make sure you show work for every problem. <u>Any work/answers written ON this sheet will not be graded!!</u>

**#s 1 - 5 are from the FIRST unit! Make sure you know these well for this test, especially if you need this grade to bring up your first test grade!!*
***The questions with asterisks are <u>NON-CALCULATOR</u>!*

Determine whether the function is linear or quadratic. Identify the quadratic, linear, and constant terms.

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

Identify the vertex and the axis of symmetry of the parabola. Identify points corresponding to *P* and *Q*.

2. 

Find a quadratic model for the set of values (Hint: use the STAT button on the calculator!!)

3.

x	–2	0	4
***f*(*x*)**	–22	–2	–10

4. Dalco Manufacturing estimates that its weekly profit, *P*, in hundreds of dollars, can be approximated by the formula $P = -2x^2 + 8x + 7$, where *x* is the number of units produced per week, in thousands.
   a. How many units should the company produce per week to earn the maximum profit?
   b. Find the maximum weekly profit.

5. Identify the vertex and the *y*-intercept of the graph of the function $y = -3(x - 3)^2 + 2$.

Solve by factoring.

6. $x^2 + 11x + 24 = 0$

7. $x^2 - 15x + 50 = 0$

8. $3x^2 + 11x + 10 = 0$

9. $2x^2 - 9x - 18 = 0$

Solve the equation by finding square roots.

**10. $4x^2 = 16$

**11. $3x^2 = 18$

12. The function $y = -16t^2 + 502$ models the height *y* in feet of a stone *t* seconds after it is dropped from the edge of a vertical cliff.
    a) How long will it take the stone to hit the ground? Round to the nearest hundredth of a second.
    b) How high will the stone be after 3 seconds?

13. Simplify $\sqrt{-216}$ using the imaginary number *i*.

Write the number in the form *a* + *bi*.

14. $\sqrt{-36} + 5$

15. $-1 - \sqrt{-50}$

16. Find $|4 - 4i|$. *(Hint: plot the imaginary number as a point, then find the distance from zero.)*

Simplify the expression.

17. $(4 + 2i) + (-2 - 3i)$

18. $(2 + 5i) - (-4 - 6i)$

19. $(-i)(4i)$

20. $(6 - i)(5 + 3i)$

#21 – Solve the equation (hint: your answer should have an *i* in it).

21. $4x^2 + 16 = 0$

22. Find the missing value to complete the square.
$x^2 + 24x + \_\_\_\_$

Solve the quadratic equation by completing the square.

**23. $x^2 + 14x + 42 = 0$

**24. $x^2 + 2x + 11 = 0$

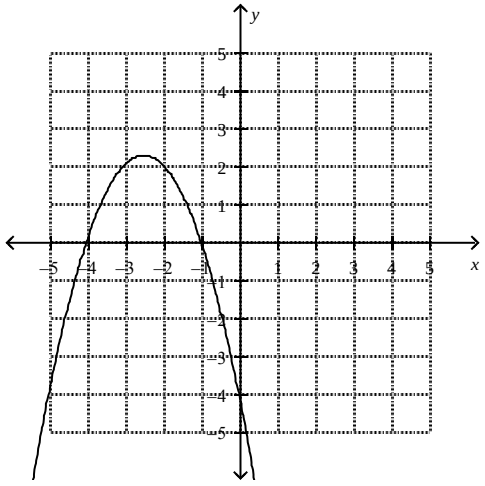
**25. $x^2 + 18x + 81 = 81$

Use the Quadratic Formula to solve the equation.

26. $-2x^2 - 10x - 8 = 0$

**27. $x^2 + 7x - 9 = 0$

28. Solve $-x^2 + 5x + 4 \leq 0$



29. Solve $3x^2 - 2x - 5 < 0$

30. Elena got tired of doing her Algebra 2 homework, so she threw her book up in the air. The equation for the book's height (in inches) is given by $y = -16x^2 + 28x$.
a) For what values of x is the book at or above 12 inches?
b) How long is the book at or above 12 inches?

31. The area of a rectangular garden is 12 square feet. The length is 5 more than 3 times the width. Find the length and width of the garden.

Rewrite in vertex form:

32. $y = x^2 + 6x - 13$

33. $y = x^2 - 8x + 11$