## 5.1-5.4 Quadratics Review Fall 2013 - Due on day of test!

Use a separate sheet of paper to show ALL WORK - you WILL lose points if you don't have work shown for each problem !!

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

1. 
$$y = (x + 1)(3x + 2) - 3x^2$$
  
2.  $f(x) = (3x - 2)(5x + 3)$ 

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



- 5. A manufacturer determines that the number of drills it can sell is given by the formula
  - $D = -3p^2 + 180p 305$ , where p is the price of the drills in dollars.

**a.** At what price will the manufacturer sell the maximum number of drills?

- **b.** What is the maximum number of drills that can be sold?
- 6. Dalco Manufacturing estimates that its weekly profit, *P*, <u>in hundreds of dollars</u>, can be approximated by the formula  $P = -5x^2 + 10x + 9$ , where *x* is the number of units produced per week, <u>in thousands</u>.
  - **a.** How many units should the company produce per week to earn the maximum profit?
  - **b.** Find the maximum weekly profit.
- 7. Write  $y = 4x^2 24x + 34$  in vertex form.

## Use vertex form to write the equation of the parabola.



8.



Write the equation of the parabola in vertex form. 10. vertex (-4, 4), point (-1, 31)

Find a quadratic model for the set of values. 11. (-2, 6), (0, -2), (4, 78)

- 13. In an experiment, a petri dish with a colony of bacteria is exposed to cold temperatures and then warmed again.a. Find a quadratic model for the data in the table.
  - **b.** Use the model to estimate the population of bacteria at 9 hours.

Time (hours)	0	1	2	3	4	5	6
Population (1000s)	5.1	3.03	1.72	1.17	1.38	2.35	4.08

14. Graph 
$$y = 2(x+1)^2 - 5$$
.

15. Graph 
$$y = -4(x-1)^2 + 3$$
.

- 16. Graph  $y = 3x^2 5$ . Identify the domain and range.
- 17. Graph  $y = x^2 + 5x + 4$ . Identify the vertex and the axis of symmetry.
- 18. Graph  $y = -2x^2 + 4x + 7$ . Does the function have a maximum or minimum value? What is this value?
- 19. Graph  $y = (x 7)^2 + 1$ . Identify the domain and range.
- 20. Consider the function  $f(x) = -3x^2 6x + 4$ . Determine whether the graph opens up or down. Find the axis of symmetry, the vertex and the *y*-intercept.
- 21. Identify the axis of symmetry for the graph of  $f(x) = -2x^2 4x 2$ .

Factor the expression.

- 22.  $21x^2 + 18x$ 23.  $x^2 + 19x + 90$ 24.  $x^2 + 11x + 24$ 25.  $x^2 x 30$ 26.  $3x^2 + 11x + 6$ 27.  $4x^2 + 13x + 10$
- 28.  $25x^2 49$

## Write the quadratic equation in vertex form.

$$29. \quad y = -3x^2 - 12x - 8$$

30. 
$$\gamma = 2x^2 + 16x + 34$$

