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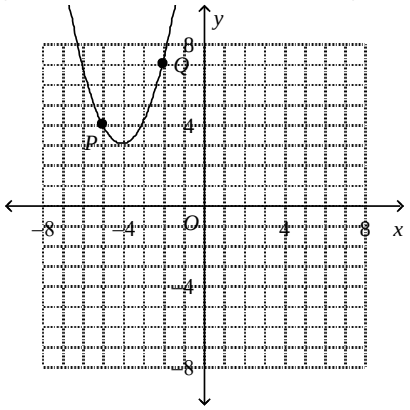
Intro to Quadratics Test Review

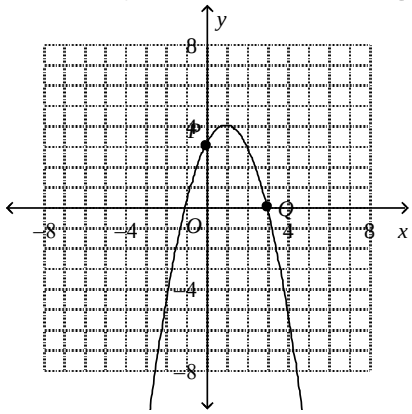
Use a separate sheet of paper to show ALL WORK! Due on day of test!

#1-2: Identify the vertex and the axis of symmetry of the parabola. Identify points corresponding to *P* and *Q*.

1.

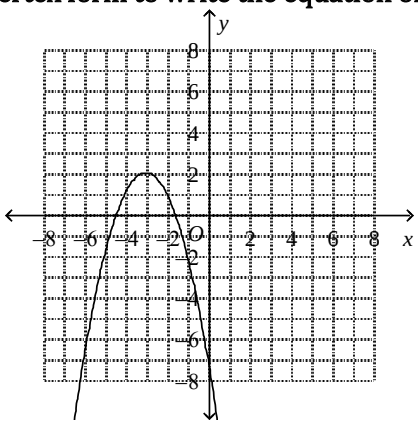


2.

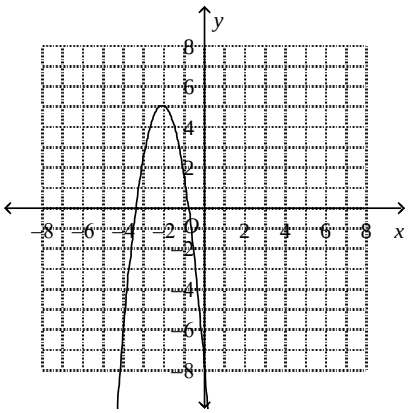


#3-4: Use vertex form to write the equation of the parabola.

3.



4.



5. Write the equation of the parabola in vertex form given a vertex of (–4, 4) and the point (–1, 31).

#6-7: Find a quadratic model for the set of values. (Hint: Use quadratic regression.)

6. (–2, 6), (0, –2), (4, 78)

7. (–2, 18), (0, –2), (4, 30)

8. 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

9. Graph $y = 2(x+1)^2 - 5$. What is vertex, y-intercept?
10. Graph $y = -4(x-1)^2 + 3$. What is vertex, y-intercept?
11. Graph $y = 3x^2 - 5$. Identify the domain and range.
12. Graph $y = x^2 + 5x + 4$. Identify the vertex and the axis of symmetry.
13. Graph $y = -2x^2 + 4x + 7$. Does the function have a maximum or minimum value? What is this value?

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14. Graph $y = (x - 7)^2 + 1$. Identify the domain and range.

15. Consider the function $f(x) = -3x^2 - 6x + 4$. Determine whether the graph is concave up or concave down. Find the axis of symmetry, the vertex and the *y*-intercept.

16. Identify the vertex and axis of symmetry for the graph of $f(x) = -2x^2 - 4x - 2$.

#17-18: Write the quadratic equation in vertex form.

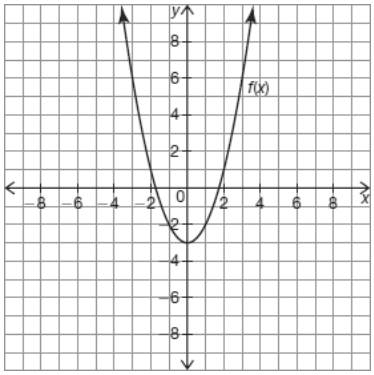
17. $y = -3x^2 - 12x - 8$

18. $y = 2x^2 + 16x + 34$

19. If you translate the graph of $y = (x + 2)^2 - 1$ to the right 4 units and down 3 units, what is the equation of the parabola in vertex form?

20. If you translate the graph of $y = (x + 2)^2 - 1$ to the left 2 units and up 6 units, what is the equation of the parabola in vertex form?

21. The graph of $f(x)$ is shown. Sketch the graph of the given transformed function. $t(x) = -f(x - 4)$



22. A spectator in the crowd throws a treat to one of the dogs in a competition. The spectator throws the treat from the bleachers 19 feet above ground. The treat amazingly flies 30 feet and just barely crosses over a hoop which is 7.5 feet tall. The dog catches the treat 6 feet beyond the hoop when his mouth is 1 foot from the ground. Write a function to represent the height of the treat in terms of its distance. *(You will need to use a calculator!)*

23. The Amazing Larry is a human cannonball. He would like to reach a maximum height of 30 feet during his next launch. Based on Amazing Larry's previous launches, his assistant Kel has estimated that this will occur when he is 40 feet from the cannon. When Amazing Larry is shot from the cannon, he is 10 feet above the ground. Write a function to represent Amazing Larry's height in terms of his distance.

24. Crazy Cornelius is a fire jumper. He is attempting to run and jump through a ring of fire. He runs for 10 feet and begins his jump. He passes through the ring of fire and hits his highest height 4 feet later at a height of 5 feet. Write a function to represent Crazy Cornelius' height in terms of his distance.

25. A manufacturer determines that the number of drills it can sell is given by the formula $D = -4p^2 + 176p - 320$, 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?

26. Dalco Manufacturing estimates that its weekly profit, P, in hundreds of dollars, can be approximated by the formula $P = -2x^2 + 8x + 10$, 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.