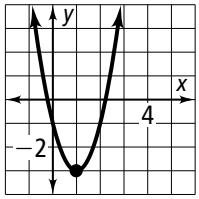
Name _____ Class _____ Date _____

Practice

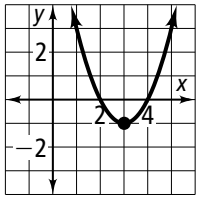
Form G

Quadratic Graphs and Their Properties

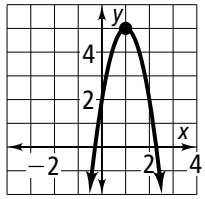
Identify the vertex of each graph. Tell whether it is a minimum or a maximum.

1. 

(1, − 3); minimum

2. 

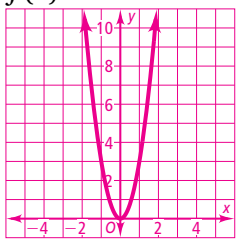
(3, − 1); minimum

3. 

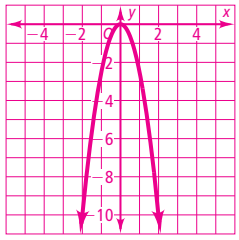
(1, 5); maximum

Graph each function.

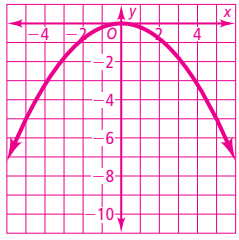
4. $f(x) = 3x^2$



5. $f(x) = -2.5x^2$



6. $f(x) = -\frac{1}{5}x^2$



Order each group of quadratic functions from widest to narrowest graph.

7. $y = -3x^2, y = -5x^2, y = -1x^2$

$-x^2;\ -3x^2;\ -5x^2$

8. $y = 4x^2, y = -2x^2, y = -6x^2$

$-2x^2;\ 4x^2;\ -6x^2$

9. $y = x^2, y = \frac{1}{3}x^2, y = 2x^2$

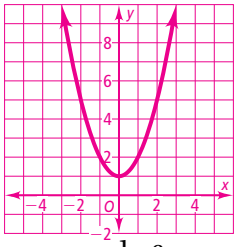
$\frac{1}{3}x^2;\ x^2;\ 2x^2$

10. $y = \frac{1}{6}x^2, y = \frac{1}{4}x^2, y = \frac{1}{2}x^2$

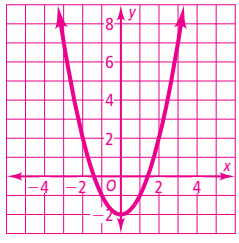
$\frac{1}{6}x^2;\ \frac{1}{4}x^2;\ \frac{1}{2}x^2$

Graph each function.

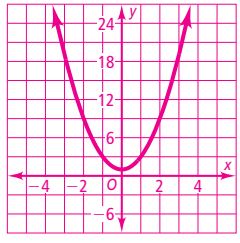
11. $f(x) = x^2 + 1$



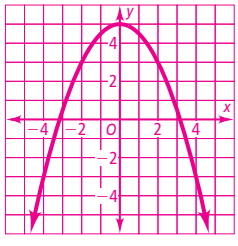
12. $f(x) = x^2 - 2$



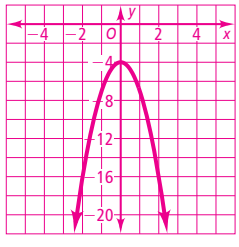
13. $f(x) = 2x^2 + 1$



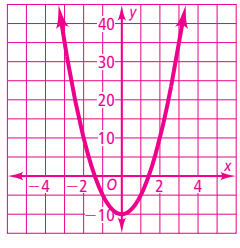
14. $f(x) = -\frac{1}{2}x^2 + 5$



15. $f(x) = -3x^2 - 4$



16. $f(x) = 5x^2 - 10$



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Name _____ Class _____ Date _____

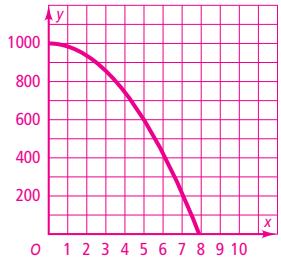
Practice (continued) *Form G*

Quadratic Graphs and Their Properties

17. For a physics experiment, the class drops a golf ball off a bridge toward the pavement below. The bridge is 75 feet high. The function $h = -16t^2 + 75$ gives the golf ball's height h above the pavement (in feet) after t seconds. Graph the function. How many seconds does it take for the golf ball to hit the pavement?

about 2.2 s

18. A relief organization flew over a village and dropped a package of food and medicine. The plane is flying at 1000 feet. The function $h = -16t^2 + 1000$ gives the package's height h above the ground (in feet) after t seconds. Graph the function. How many seconds does it take for the package to hit the ground?



about 8 s

Identify the domain and range of each function.

19. $y = 5x^2 - 5$

D: all real numbers; R: $y \geq -5$

20. $y = -\frac{1}{2}x^2 + 3$

D: all real numbers; R: $y \leq 3$

21. $y = \frac{3}{5}x^2 - 2$

D: all real numbers; R: $y \geq -2$

22. $f(x) = -9x^2 + 1$

D: all real numbers; R: $f(x) \leq 1$

Use a graphing calculator to graph each function. Identify the vertex and axis of symmetry.

23. $y = 2.75x^2 + 3$

(0, 3); $x = 0$;

24. $y = -\frac{1}{3}x^2 - 8$

(0, −8); $x = 0$;

25. $y = -2x^2 + 7$

(0, 7); $x = 0$;

26. Writing Discuss how the function $y = x^2 + 4$ differs from the graph $y = x^2$.

The parent function of $y = x^2 + 4$ is $y = x^2$. Both graphs open the same width and are parabolas that open up. The graph of $y = x^2$ has a vertex of (0, 0). The graph of $y = x^2 + 4$ has a vertex of (0, 4) — it is 4 units above the graph of $y = x^2$.

27. Writing Explain how you can determine if the parabola opens up or down by simply examining the equation.

The coefficient of the x^2 term determines if the parabola opens up or down. A positive coefficient, the graph opens up; a negative coefficient, the graph opens down.

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