

Quadratics Review

Name Key pd _____ Date _____

Fill in the blank with the correct vocabulary term or terms.

1. The line passing through the vertex that divides the parabola into 2 symmetric parts is called the

axis of symmetry

2. If $|a| < 1$, the parabola is wider than $y = x^2$.

3. If $|a| > 1$, the parabola is skinnier than $y = x^2$.

$$x = \frac{-b}{2a}$$

4. The formula to find the axis of symmetry or x coordinate of the vertex is _____.

$$y = a(x-h)^2 + k$$

5. The vertex form of a quadratic equation is _____.

quadratic

6. A quadratic function can be written in the standard form
 $y = ax^2 + bx + c$ where $a \neq 0$.

7. Every quadratic function has a U-shaped graph called a parabola.

8. If the leading coefficient a is positive, the parabola opens concave upward.

concave downward

9. If the leading coefficient a is negative, the parabola opens _____.

10. The vertex is the lowest point of a parabola that opens up and the highest point of the parabola that opens down.

Answer Bank

$x = \frac{-b}{2a}$	<u>wider</u>	Concave downward	Parabola
$y = a(x-h)^2 + k$	Quadratic	Skinnier	$x = \frac{-b}{2a}$
Concave upward	Axis of symmetry	$y = a(x+h)^2 - k$	minimum

Identify each as linear, quadratic or neither.

11. $y = 2x^2 + 3x - 1$ quadratic

12. $y = 2x + 5$ linear

13. $x = 3$ linear

14. $x^2 + y^2 = 9$ neither

15. $y = \frac{2}{3}x^2 - 12$ linear

16. $y = (x - 1)^2$ quadratic

Fill in the missing information.

17. $y = -6x^2 + 3x - 12$

What is the direction of opening? down
Is the vertex a max or min? max
Wider, narrower or same as $y = x^2$ narrower

18. $y = \frac{1}{4}x^2 - 8x - 2$

What is the direction of opening? up
Is the vertex a max or min? min
Wider, narrower or same as $y = x^2$ wider

19. $y = \frac{5}{4}x^2 + 3x - 7$

What is the direction of opening? up
Is the vertex a max or min? min
Wider, narrower or same as $y = x^2$ skinnier

20. $y = 9 - x^2$

What is the direction of opening? down
Is the vertex a max or min? max
Wider, narrower or same as $y = x^2$ same

Find the vertex and axis of symmetry for the quadratic functions. Write the equation in vertex form.

21. $y = 2x^2 - 16x - 33$

$a = 2$ $b = -16$ $c = 33$

Axis of Symmetry $\frac{-b}{2a} = \frac{16}{2(2)} = 4$

$y = 2(4)^2 - 16(4) - 33$

Vertex $y = 32 - 64 - 33$

$y = 1$ $(4, 1)$

Vertex form $y = 2(x - 4)^2 + 1$

22. $y = -x^2 + 2x + 1$

$a = -1$ $b = 2$ $c = 1$

$x = \frac{-b}{2a} = \frac{2}{2(-1)} = 1$

Axis of Symmetry $x = 1$

$y = -(1)^2 + 2(1) + 1$

$y = -1 + 2 + 1 = 2$

Vertex $(1, 2)$

Vertex form: $y = -(x - 1)^2 + 2$

23. $y = 3x^2 - 10$

$$a = \underline{3} \quad b = \underline{0} \quad c = \underline{-10}$$

$$x = \frac{-0}{2(3)} = 0$$

Axis of Symmetry $x = 0$

$$y = 3(0)^2 - 10 = -10$$

Vertex $(0, -10)$

Vertex form: $y = 3(x)^2 - 10$

24. $y = -8x + 13 + x^2$

$$a = \underline{1} \quad b = \underline{-8} \quad c = \underline{13}$$

$$x = \frac{8}{2(1)} = 4$$

Axis of Symmetry $x = 4$

$$y = -8(4) + 13 + (4)^2$$

$$\text{Vertex } y = -32 + 13 + 16$$

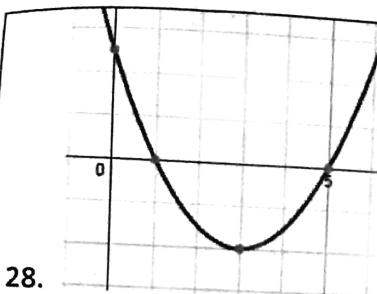
$$y = -3 \quad (4, -3)$$

Vertex Form: $y = (x - 4)^2 - 3$

Write the following in standard form and find the y-intercept.

Vertex Form	Standard Form	Y-intercept
<p>25. $y = 6(x - 4)^2 - 10$</p> $y = 6(x^2 - 8x + 16) - 10$ $y = 6x^2 - 48x + 96 - 10$ $y = 6x^2 - 48x + 86$	$y = \underline{6x^2 - 48x + 86}$ $y = 6(0)^2 - 48(0) + 86$	$y = 86$ $(0, 86)$
<p>26. $y = (x - 3)^2 + 2$</p> $y = x^2 - 6x + 9 + 2$ $y = x^2 - 6x + 11$	$y = \underline{x^2 - 6x + 11}$ $y = 0^2 - 6(0) + 11$	$y = 11$ $(0, 11)$
<p>27. $y = -3(x - 1)^2 + 2$</p> $y = -3(x^2 - 2x + 1) + 2$ $y = -3x^2 + 6x - 3 + 2$ $y = -3x^2 + 6x - 1$	$y = \underline{-3x^2 + 6x - 1}$ $y = -3(0)^2 + 6(0) - 1$	$y = -1$ $(0, -1)$

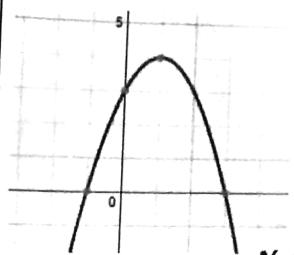
Identify the vertex and the y-intercept of the following graph and then match it to the appropriate equation



28.
Axis of symmetry = $x = 3$
Vertex: $(3, -2)$
y-intercept: $(0, 2.5)$

matches to Equation B

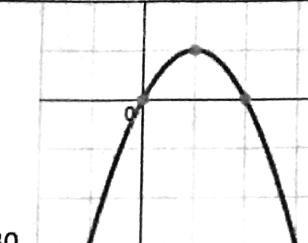
29.



Axis of symmetry = $x = 1$
Vertex: $(1, 1)$
y-intercept: $(0, 3)$

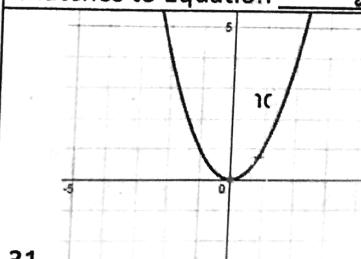
Matches to Equation I

30.



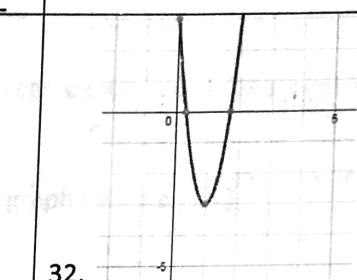
Axis of symmetry = $x = 1$
Vertex: $(1, 1)$
y-intercept: $(0, 0)$

Matches to Equation A



31.
Axis of symmetry = $x = 0$
Vertex: $(0, 0)$
y-intercept: $(0, 0)$

Matches to Equation E



32.
Axis of symmetry = $x = 1$
Vertex: $(1, -3)$
y-intercept: $(0, 3)$

Matches to Equation F



33.
Axis of symmetry = $x = -2$
Vertex: $(-2, 3)$
y-intercept: $(0, 1)$

Matches to Equation G

Match the above graphs to the following equations

$$x = -1$$

A. ~~$y = -x^2 + 2x$~~ $x = 1$
 $y = 1$

B. ~~$y = \frac{1}{2}(x - 3)^2 - 2$~~

C. $y = 6x^2 + 12x - 3$ $y = -$

D. $y = x^2 + 2x$ $x = -1$
 $y = -1$

E. ~~$y = x^2$~~

F. ~~$y = 6x^2 - 12x + 3$~~ $x = 1$ $y = -3$

G. ~~$y = \frac{1}{2}(x + 2)^2 + 3$~~

H. $y = \frac{1}{2}(x + 3)^2 - 2$

I. ~~$y = x^2 + 2x + 3$~~ $x = 1$

$(-3, -2)$

$y = 4$