

Name: _____ Date: _____

Converting Forms of a Quadratic

Convert from vertex form to standard form.

$$1. f(x) = (x+4)^2 + 5$$

$$(x+4)(x+4) + 5$$

$$(x^2 + 8x + 16) + 5$$

$$f(x) = x^2 + 8x + 21$$

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

$$f(x) = -x^2 - 6x - 11$$

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

$$2(x-2)(x-2) - 3$$

$$2(x^2 - 4x + 4) - 3$$

$$2x^2 - 8x + 8 - 3$$

$$f(x) = 2x^2 - 8x + 5$$

Convert from standard form to vertex form by using $x = -b/2a$. Then, give the axis of symmetry and vertex.

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

$$f(x) = (x+2)^2 - 1$$

vertex: $(-2, -1)$ AOS: $x = -2$

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

$$a=1 \quad b=-2 \quad c=5$$

$$h = \frac{2}{2(1)} = 1 = h$$

$$k = (1)^2 - 2(1) + 5$$

$$k = 4$$

$$f(x) = (x-1)^2 + 4$$

vertex: $(1, 4)$ AOS: $x = 1$

$$6. f(x) = 2x^2 - 8x + 17$$

$$f(x) = 2(x-2)^2 + 9$$

vertex $(2, 9)$ AOS $x = 2$

Convert from standard form to vertex form by using the calculator. Then, give the axis of symmetry and vertex.

$$7. f(x) = x^2 - 8x + 15$$

$$a=1 \quad b=-8 \quad c=15$$

$$a=1 \quad h=4 \quad k=-1$$

$$f(x) = (x-4)^2 - 1$$

vertex $(4, -1)$ AOS: $x = 4$

$$8. f(x) = x^2 - 4x$$

$$f(x) = (x-2)^2 - 4$$

vertex $(2, -4)$ AOS $x = 2$

$$9. f(x) = 2x^2 + 12x + 7$$

$$a=2 \quad b=12 \quad c=7$$

$$a=2 \quad b=-3 \quad c=-11$$

$$f(x) = 2(x+3)^2 - 11$$

vertex $(-3, -11)$ AOS $x = -3$

10. Find the axis of symmetry and vertex for the two functions representing the trajectory of a ball.

$$a) f(t) = -16t^2 + 64t + 10$$

$$\text{vertex: } (2, 74)$$

$$\text{AOS: } x = 2$$

$$b) g(t) = -16t^2 + 64t + 30$$

$$\text{vertex: } (2, 94)$$

$$\text{AOS: } x = 2$$

Which function will be higher at its peak? **Function B $94 > 74$**

How can you determine that by looking at the equation in standard form?

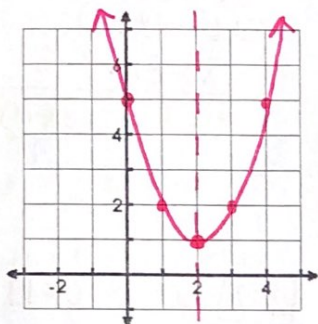
The "c" value is the only piece that differs in the equations and $30 > 10$.

Graphing in Standard Form Practice

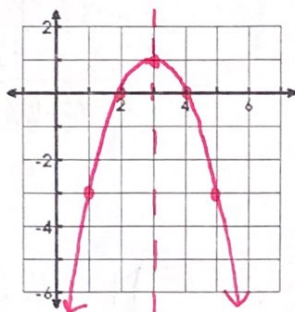
1. $f(x) = x^2 - 4x + 5$

$$f(x) = (x-2)^2 + 1$$

Vertex: (2, 1)

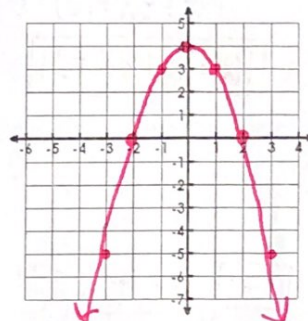


2. $f(x) = -x^2 + 6x - 8$



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

Vertex: (0, 4)



Solving Quadratics Practice

1. What is the best method to solve the following quadratic? $x^2 + 9x + 20 = 0$

- A. Factoring B. Square Roots C. Completing the Square D. Quadratic Formula

2. What are the solutions to the equation in number 1?

- A. 4 and 5 B. -4 and -5 C. 2 and 10 D. -2 and -10

$$x^2 + 9x + 20 = (x+4)(x+5)$$

$$x+4=0 \quad x+5=0$$

$$x=-4 \quad x=-5$$

3. What is the best method to solve the following quadratic? $\frac{1}{2}(x-1)^2 = 6$

- A. Factoring B. Square Roots C. Completing the Square D. Quadratic Formula

4. What are the solutions to the equation in number 3?

- A. $1 \pm \sqrt{3}$ B. $-1 \pm \sqrt{3}$ C. $2 \pm \sqrt{6}$ D. $-2 \pm \sqrt{6}$

5. What is the best method to solve the following quadratic? $x^2 + 12x = -21$

- A. Factoring B. Square Roots C. Completing the Square D. Quadratic Formula

6. What are the solutions to the equation in number 5?

- A. $-12 \pm \sqrt{15}$ B. $-6 \pm \sqrt{15}$ C. $6 \pm \sqrt{15}$ D. $12 \pm \sqrt{15}$

$$x^2 + 12x + 36 = -21 + 36$$

$$\sqrt{(x+6)^2} = \sqrt{15}$$

$$x+6 = \pm\sqrt{15}$$

$$x = -6 \pm \sqrt{15}$$