Notes: Factored Form Day 1 Name: _____

Warm-Up

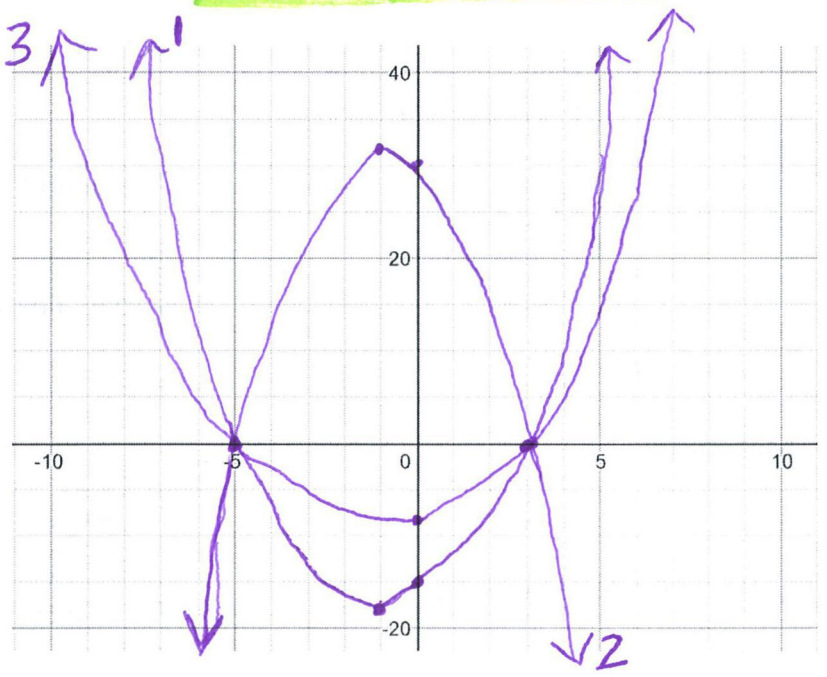
Solve for x

1. $2x = 0$ → $x = 0$
2. $x + 7 = 0$ → $x = 7$
3. $(x - 3) = 0$ → $x = 3$
4. $(x + 9) = 0$ → $x = -9$

Standard: $ax^2 + bx + c$ **Vertex:** $a(x-h)^2 + k$ **Factored:** $a(x - r_1)(x - r_2)$

Factored Form of a Quadratic Function $f(x) = A(x - r_1)(x - r_2)$

1. Sketch each below on the same Graph



1 $f(x) = (x - 3)(x + 5)$

2 $f(x) = -2(x - 3)(x + 5)$

3 $f(x) = \frac{1}{2}(x - 3)(x + 5)$

★ What is the same for each function?
Roots / x-int

★ What is different for each function?
y-int, vertex, factor/width, opens up/down

2. Given: $f(x) = -5(x + 4)(x - 16)$

a. What are the zeros?
$x + 4 = 0$ → $x = -4$ (-4, 0)
$x - 16 = 0$ → $x = 16$ (16, 0)

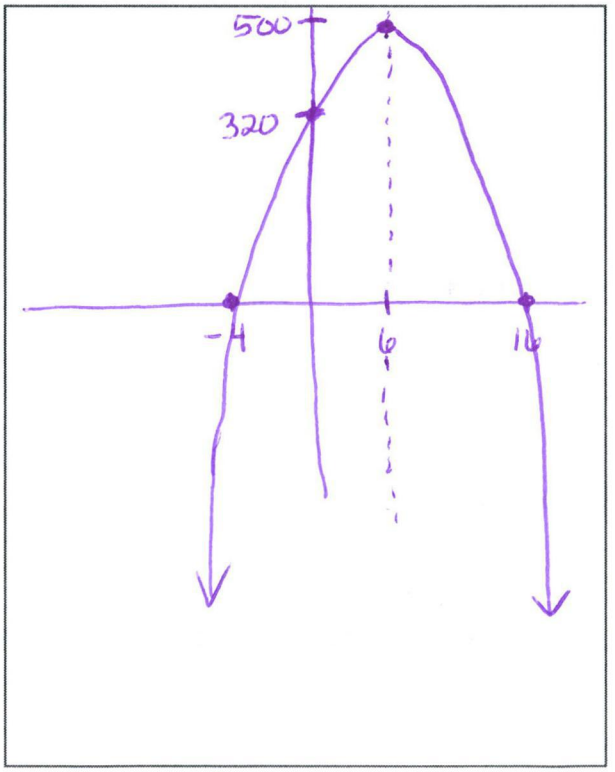
b. Use algebra to find the axis of symmetry ($x = 6$)
$16 + 4 = 20$
$20 \div 2 = 10$
$16 - 10 = 6$
$x = 6$

c. Does the parabola have a maximum or minimum?
Vertex: (6, 500)

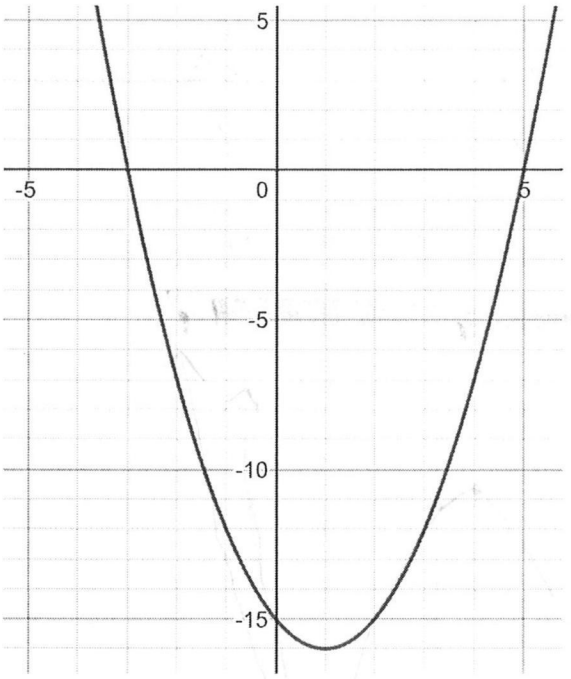
d. Find $f(0) = 500$ What is $f(0)$? y-intercept
$y = -5(0+4)(0-16)$ (0, 320)

e. Sketch and label $f(x) = -5(x + 4)(x - 16)$

(vertex, A.O.S., Zeros and y-int.)



3. Find the **Zeros, A.O.S. and Vertex** for the following, then **write the Quadratic Function** in **Factored Form** $f(x) = A(x - r_1)(x - r_2)$



Zeros _____

A.O.S._____

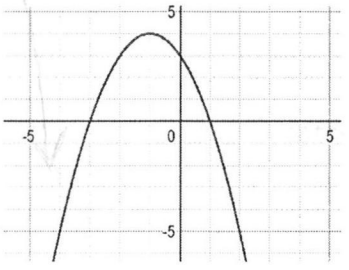
Vertex _____

Factored Form: _____

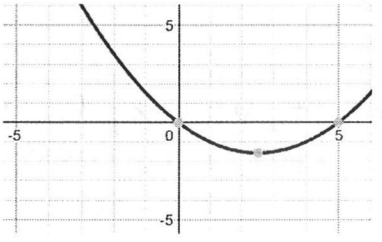
Vertex Form: _____

4. Matching:

1. $f(x) = -(x + 3)(x - 1)$ _____ a.

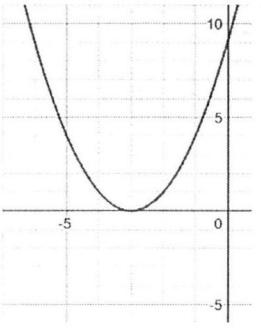


b.

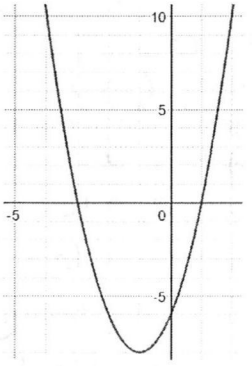


2. $f(x) = 2(x + 3)(x - 1)$ _____

3. $f(x) = \frac{1}{4}x(x - 5)$ _____ c.



d.



4. $f(x) = (x + 3)(x + 3)$ _____

5. What does $(x - 4)^2$ mean? _____

6. What would the Zeros of $f(x) = (x - 4)^2$ be? _____ explain: