

Vertex Form Worksheet A

Name: Key Hr: _____

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

Change the equation from standard form to vertex form. Identify the vertex and axis of symmetry.

1. $y = x^2 + 4x - 12$

$y = x^2 + 4x + 4 - 12 - 4$
 $y = (x+2)^2 - 16$
 V: (-2, -16)
 AOS: $x = -2$

2. $y = x^2 - 6x + 21$

$y = x^2 - (x+9) + 21 - 9$
 $y = (x-3)^2 + 12$
 V: (3, 12)
 AOS: $x = 3$

3. $y = x^2 - 8x + 4$

$x^2 - 8x + 16 + 4 - 16$
 $y = (x-4)^2 - 12$
 V: (4, -12)
 AOS: $x = 4$

4. $y = x^2 + 3x - 5$

$x^2 + 3x + \frac{9}{4} - 5 + \frac{9}{4}$
 $y = (x + \frac{3}{2})^2 - \frac{11}{4}$
 or
 $y = (x + 1.5) - 2.75$
 V: $(-\frac{3}{2}, -\frac{11}{4})$ or $(-1.5, -1.75)$

AOS: $x = -1.5$ or $x = -\frac{3}{2}$

5. $y = 2x^2 + 4x - 12$

$y = 2(x^2 + 2x + 1) - 12 - 8$
 $y = 2(x+2)^2 - 20$
 V: (-2, -20)
 AOS: $x = -2$

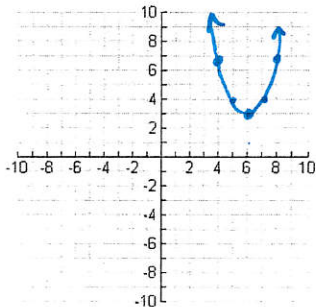
6. $y = -x^2 - 3x + 18$

$y = -1(x^2 + 3x + 2.25) + 18 + 2.25$
 $y = -1(x + 1.5) + 20.25$
 V: $(-1.5, 20.25)$ or $(-\frac{3}{2}, \frac{81}{4})$
 AOS: $x = -1.5$ or $x = -\frac{3}{2}$

Sketch the graph

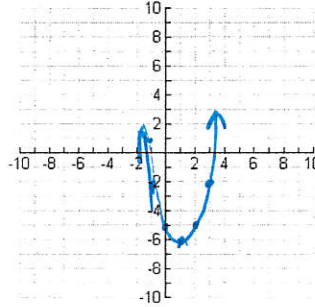
7. $y = (x-6)^2 + 3$

(6, 3)



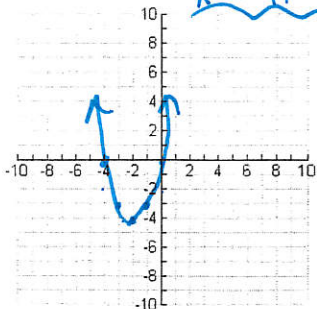
8. $y = x^2 - 2x - 5$

$x^2 - 2x + 1 - 5 - 1$
 $(x-1)^2 - 6$
 (1, -6)



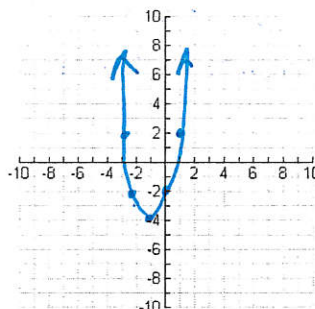
9. $y = x^2 + 4x$

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



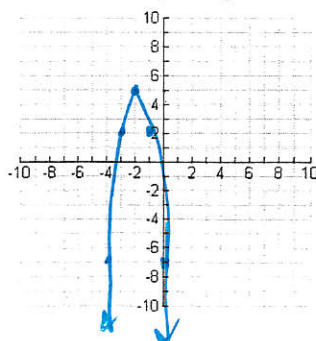
10. $y = 2(x+1)^2 - 4$

(-1, -4)



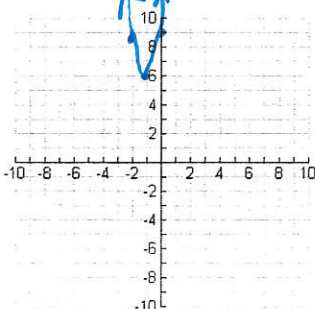
11. $f(x) = -3(x+2)^2 + 5$

(-2, 5)



12. $y = 3x^2 + 6x + 9$

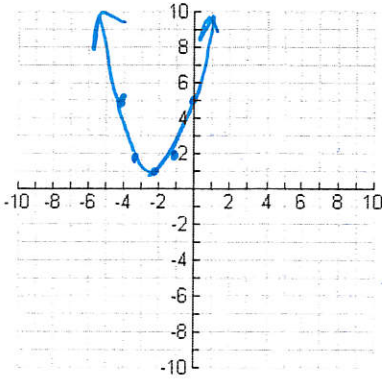
$y = 3(x^2 + 2x + 1) + 9 - 3$
 $= 3(x+1)^2 + 6$
 V: (-1, 6)



Given the quadratic equations in standard form, find the following and graph:

13. $y = x^2 + 4x + 5$

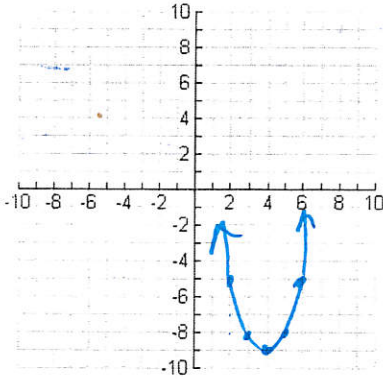
$x^2 + 4x + 4 + 5 = 4$
 $(x+2)^2 + 1$



- A) Vertex Form $y = (x+2)^2 + 1$
- B) Vertex $(-2, 1)$
- C) Axis of Symmetry $x = -2$
- D) Max/Min min
- E) y-intercept $(0, 5)$

14. $y = x^2 - 8x + 7$

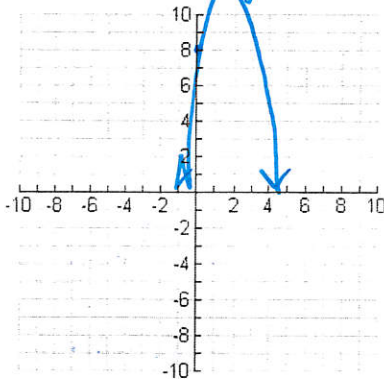
$x^2 - 8x + 16 + 7 - 16$



- A) Vertex Form $y = (x-4)^2 - 9$
- B) Vertex $(4, -9)$
- C) Axis of Symmetry $x = 4$
- D) Max/Min min
- E) y-intercept $(0, 7)$

15. $y = -2x^2 + 6x + 8$

$y = -2(x^2 - 3x + 2.25) + 8 + 4.5$
 $y = -2(x - 1.5)^2 + 13.5$



- A) Vertex Form $y = -2(x - 1.5)^2 + 13.5$
- B) Vertex $(1.5, 13.5)$
- C) Axis of Symmetry $x = 1.5$
- D) Max/Min max
- E) y-intercept $(0, 8)$