

Corrected & circled
+ 2 if complete

10 total

Vertex Form Worksheet B

Name: key Hr. _____

Axis of symmetry: $h = x = \frac{-b}{2a}$ $k = f(h)$ Vertex: (h, k) Vertex form: $y = a(x - h)^2 + k$

Use the formula $(\frac{-b}{2a}, \text{---})$ to find the vertex and then write the equation in vertex form.

1. $y = x^2 - 6x + 1$

2. $y = -4x^2 + 16x - 11$

3. $y = x^2 - 8x + 18$

$y = (x - 3)^2 - 8$
V: (3, -8)

$y = -4(x - 2)^2 + 5$
V: (2, 5)

$h = \frac{-x}{2(1)} = 4$ $k = (4)^2 - 8(4) + 18$
 $k = 2$

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

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

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

6. $f(x) = x^2 - 8x + 16$
 $h = \frac{-8}{2(1)} = 4$ $k = (4)^2 - 8(4) + 16$
 $k = 0$

$h = \frac{-2}{2(-1)} = 1$ $k = -(1)^2 + 2(1) + 5 = 6$

$h = \frac{-1}{2(2)} = \frac{1}{4}$

$k = 2(\frac{1}{4})^2 - \frac{1}{4} + 1 = 0.875$

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

$y = 2(x - \frac{1}{4})^2 + 0.875$, V: $(\frac{1}{4}, \frac{7}{8})$
or $y = 2(x - 0.25)^2 + 0.875$, V: (0.25, 0.875)

$y = (x - 4)^2$, V: (4, 0)

Find the following given the equations: (a) write the equation in vertex form, (b) identify the vertex, (c) identify the axis of symmetry, (d) state if the vertex is a max or a min, and (e) sketch a graph.

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

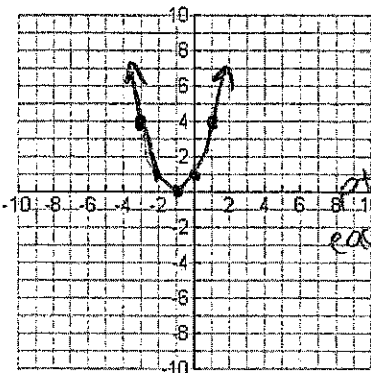
$h = \frac{-2}{2(1)} = -1$

$k = (-1)^2 + 2(-1) + 1 = 0$

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

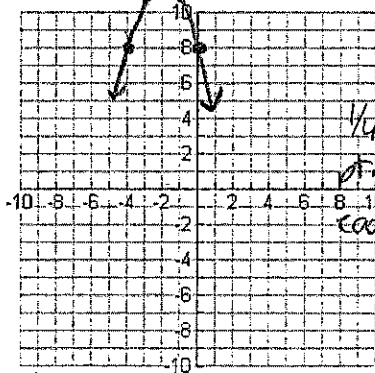
$h = \frac{-4}{2(-1)} = -2$

$k = -(-2)^2 - 4(-2) + 8 = 12$



- a) $y = (x + 1)^2$
- b) $(-1, 0)$
- c) $x = -1$
- d) min

$\frac{1}{2}$ e) ✓



- a) $y = -(x + 2)^2 + 12$
- b) V: $(-2, 12)$
- c) $x = -2$
- d) max

$\frac{1}{2}$ e) ✓

State if the equation is in vertex form or standard form or both. Then find the vertex for the equations below.

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

Vertex form
V: (6, 3)

10. $y = x^2 - 25$

both
V: (0, -25)

11. $y = -2x^2 + 20x - 35$

Standard
 $h = \frac{-20}{2(-2)} = 5$ $k = -2(5)^2 + 20(5) - 35$
 $k = 15$

V: (5, 15)

12. $y = 5x^2 - 6$

both

V: (0, -6)

13. $y = 4x^2 + 24x$

Standard

$h = \frac{-24}{2(4)} = -3$

$k = 4(-3)^2 + 24(-3) = -36$

V: (-3, -36)

14. $f(x) = -3(x + 2)^2 - 17$

Vertex

(-2, -17)