Key

Writing Quadratic Equations Day 2: Given the Zeros (roots, solutions, x intercepts) or a Graph

1-8. Write a quadratic equation *in standard form* with the given solutions.

1. $x = 4, 1$

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

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

2. $x = -5, -2$

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

$f(x) = x^2 + 7x + 10$

3. $x = 7, 0$

$(x-7)(x-0)$ or

$x(x-7)$

$f(x) = x^2 - 7x$

4. $x = \frac{1}{2}, 8$

$(2x-1)(x-8)$

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

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

5. $x = \frac{3}{5}, 0$

$x(5x-3)$

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

6. $x = \frac{2}{3}, -2$

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

$3x^2 + 6x - 2x - 4$

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

7. $x = -3, 1$

$(x+3)(x-1)$

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

8. $x = -\frac{1}{3}, 2$

$(3x+1)(x-2)$

$3x^2 - 6x + x - 2$

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

9. Write a quadratic equation given: vertex form

Vertex: (3, 1) and a point (5, – 1)

h k x y

$-1 = a(5-3)^2 + 1$

$-1 = 4a + 1$

$-1 \quad -1$

$\frac{-2}{4} = \frac{4a}{4}$

$a = -\frac{1}{2}$

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

10. Write a quadratic equation given: vertex form

Vertex: (– 1, 5) and x-intercept of 3 (3, 0)

h k

$0 = a(3+1)^2 + 5$

$-5 = 16a + 5$

$-5 \quad -5$

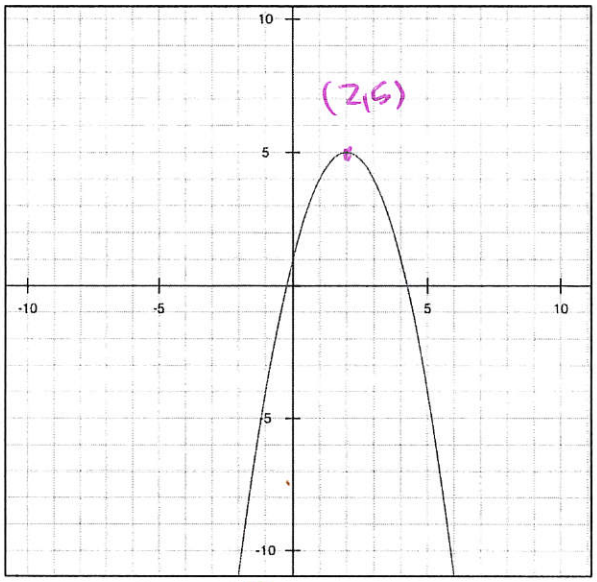
$\frac{-5}{16} = \frac{16a}{16}$

$a = -\frac{5}{16}$

$y = -\frac{5}{16}(x+1)^2 + 5$

11-18. Write a quadratic equation that represents each graph below. in vertex form

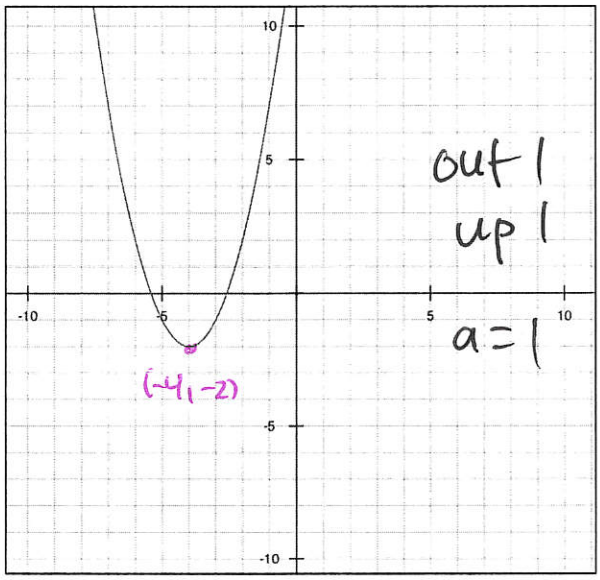
11.



out 1
down 1
$a=-1$

$y=-(x-2)^2+5$

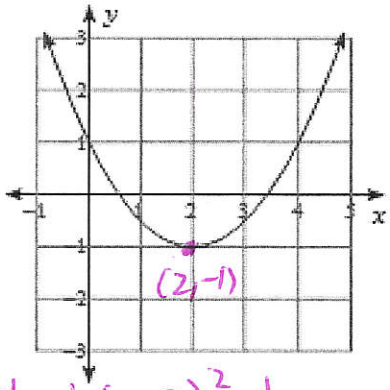
12.



out 1
up 1
$a=1$

$y=(x+4)^2-2$

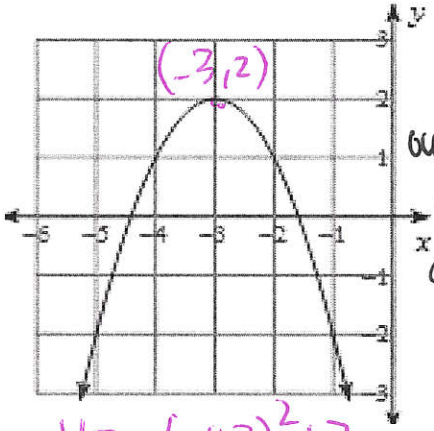
13.



out 1
up $\frac{1}{2}$
$a=\frac{1}{2}$

$y=\frac{1}{2}(x-2)^2-1$

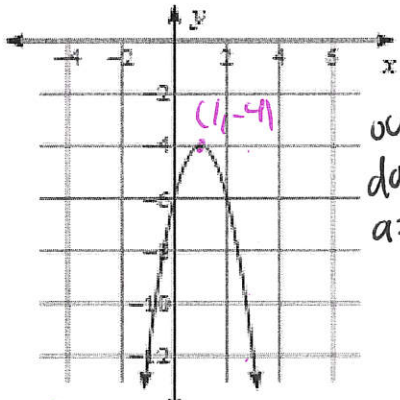
14.



out 1
down 1
$a=-1$

$y=-(x+3)^2+2$

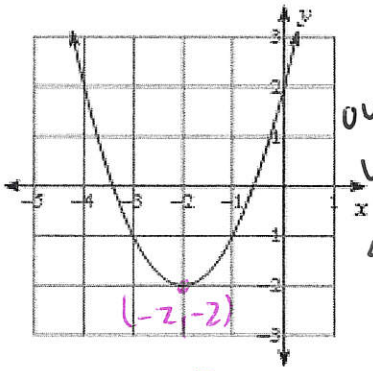
15.



out 1
down 2
$a=-2$

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

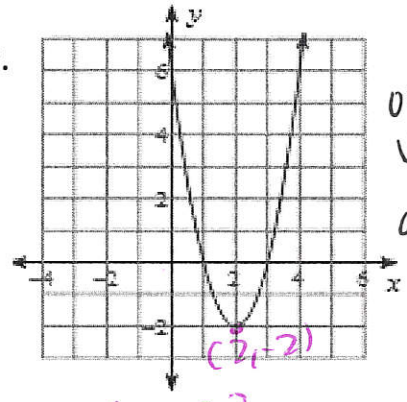
16.



out 1
up 1
$a=1$

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

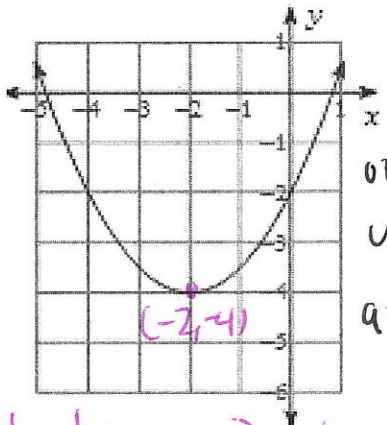
17.



out 1
up 2
$a=2$

$y=2(x-2)^2-2$

18.



out 1
up $\frac{1}{2}$
$a=\frac{1}{2}$

$y=\frac{1}{2}(x+2)^2-4$