

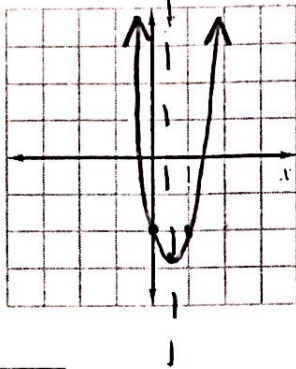
Graph the function by completing the table. Identify the graph's axis of symmetry (AOS), vertex, and tell whether the graph opens up or down.

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

AOS: $X = -\frac{1}{2}$

vertex: $(-\frac{1}{2}, -2.75)$

opens: up



x	-1	0	$-\frac{1}{2}$	1	2
y	10	-2	-2.75	-2	10

$x = \frac{-b}{2a} = \frac{-3}{2(3)} = -\frac{3}{6} = -\frac{1}{2}$

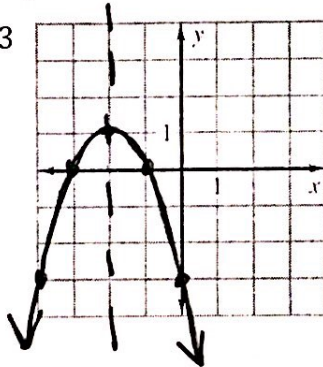
$y = 3(-\frac{1}{2})^2 + 3(-\frac{1}{2}) - 2 = -2.75$

11.) $y = -x^2 - 4x - 3$

AOS: $X = -2$

vertex: $(-2, 1)$

opens: down



x	-4	-3	-2	-1	0
y	-3	0	1	0	-3

$x = \frac{-b}{2a} = \frac{-(-4)}{2(-1)} = \frac{4}{-2} = -2$

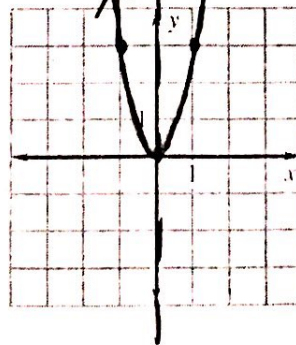
$y = -(-2)^2 - 4(-2) - 3 = 1$

13.) $y = 3x^2$

AOS: $X = 0$

vertex: $(0, 0)$

opens: up



x	-2	-1	0	1	2
y	12	3	0	3	12

$x = \frac{-b}{2a} = \frac{0}{2(3)} = 0$

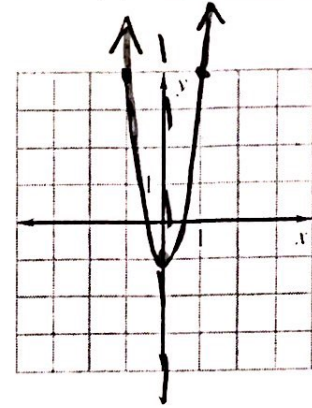
$y = 3(0)^2 = 0$

10.) $y = 5x^2 - 1$

AOS: $X = 0$

vertex: $(0, -1)$

opens: up



x	-2	-1	0	1	2
y	19	4	-1	4	19

$x = \frac{-b}{2a} = \frac{0}{2(5)} = 0$

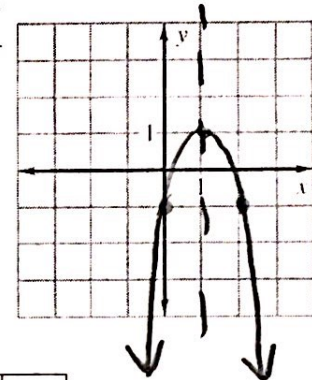
$y = 5(0)^2 - 1 = 0 - 1 = -1$

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

AOS: $X = 1$

vertex: $(1, 1)$

opens: down



x	-1	0	1	2	3
y	-7	-1	1	-1	-7

$x = \frac{-b}{2a} = \frac{-4}{2(-2)} = \frac{-4}{-4} = 1$

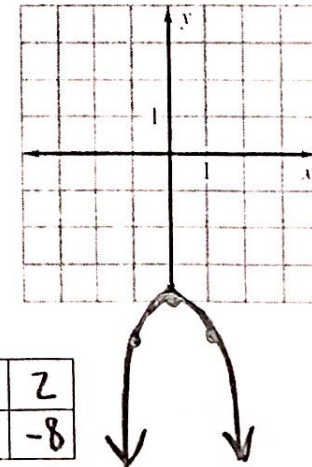
$y = -2(1)^2 + 4(1) - 1 = 1$

14.) $y = -x^2 - 4$

AOS: $X = 0$

vertex: $(0, -4)$

opens: down



x	-2	-1	0	1	2
y	-8	-5	-4	-5	-8

$x = \frac{-b}{2a} = \frac{0}{2(-1)} = 0$

$y = -(0)^2 - 4 = -4$