Notes on Graphing Quadratic Functions from Standard Form

Name_____ Date_____

Standard form: $y = ax^2 + bx + c$

Graph the following by making a table of values for each. Then state the Vertex and Axis of Symmetry.

1) $y = -x^2 + 6x - 13$

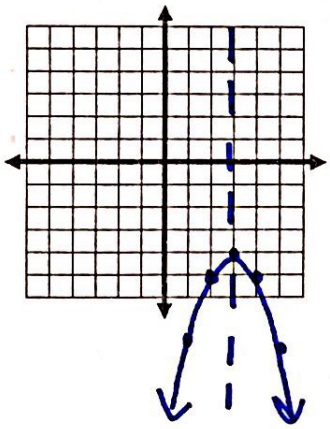
X	Y
1	-8
2	-5
3	-4
4	-5
5	-8

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

X	Y
0	1
1	-2
2	-3
3	-2
4	1

3) $y = x^2 - 2x + 1$

1.



Vertex: (3, -4)

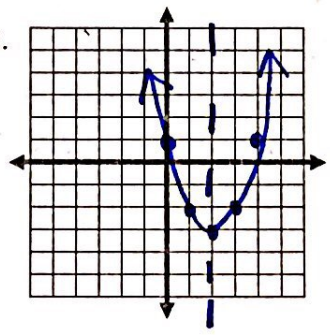
AOS: $x = 3$

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

$y = -(3)^2 + 6(3) - 13$

$y = -4$

2.



Vertex: (2, -3)

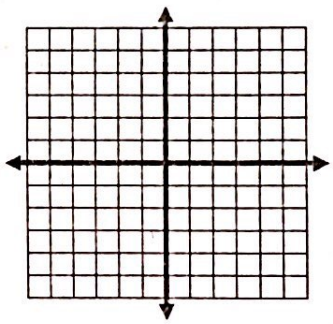
AOS: $x = 2$

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

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

$y = -3$

3.



Vertex:_____

AOS:_____

4. Suppose you launch a model rocket with an upward starting velocity of v ft/s. You can use the equation $h = -16t^2 - vt - h_0$ to find the rocket's altitude, h represents height in feet, t seconds after launch and h_0 represents initial height. Suppose the upward starting velocity is 315 ft/s and the initial height is 3 ft. When will the rocket hit the ground?

$h = -16t^2 + vt + h_0$

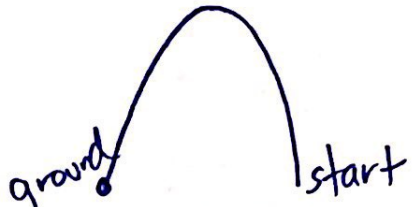
$0 = -16t^2 + 315t + 3$

$t = \dfrac{-315 \pm \sqrt{(315)^2 - 4(-16)(3)}}{2(-16)}$

$t = \dfrac{-315 \pm 315.3}{-32}$

$t = -0.009$

$t = 19.7$ sec



5. Hugh Betcha launched a model rocket with an initial speed of 88 feet per second. After how many seconds will the rocket be 40 feet high? Use: $h = -16t^2 + vt$.

$h = -16t^2 + vt$

$40 = -16t^2 + 88t$

$0 = -16t^2 + 88t - 40$

$0 = -8(2t^2 - 11t + 5)$

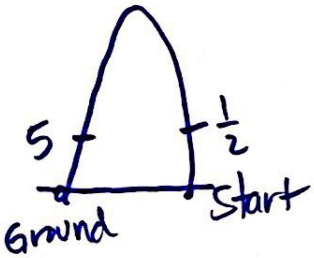
10, -1, -10, -11

$0 = -8([2t^2 - 10t] - [1t + 5])$

$0 = -8(2t(t-5) - 1(t-5))$

$0 = -8(t-5)(2t-1)$

$t = 5, \frac{1}{2}$



6. Suppose you launch a firecracker with an upward starting velocity of v ft/s. You can use the equation $h = -16t^2 - vt - h_0$ to find the firecracker's altitude *h* feet *t* seconds after launch. Suppose the upward starting velocity is 185 ft/s and the initial height is 2 feet. At what time will the firecracker be at its maximum height? What is the maximum height? Find vertex

$h = -16t^2 + vt + h_0$

$h = -16t^2 + 185t + 2$

$t = \dfrac{-b}{2a} = \dfrac{-185}{2(-16)} =$ 5.8 sec Time it took

$h = -16(5.8)^2 + 185(5.8) + 2$

$h =$ 536.8 ft Max height