

**Practice:**

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

a) Find the a.o.s. =  $x = \frac{-b}{2a} = \frac{-(-4)}{2(1)} = \frac{4}{2} = 2 = x$

b) Vertex: (2, 1)  $y = (2)^2 - 4(2) + 5 = 1 = y$

c) Y intercept (0, 5)

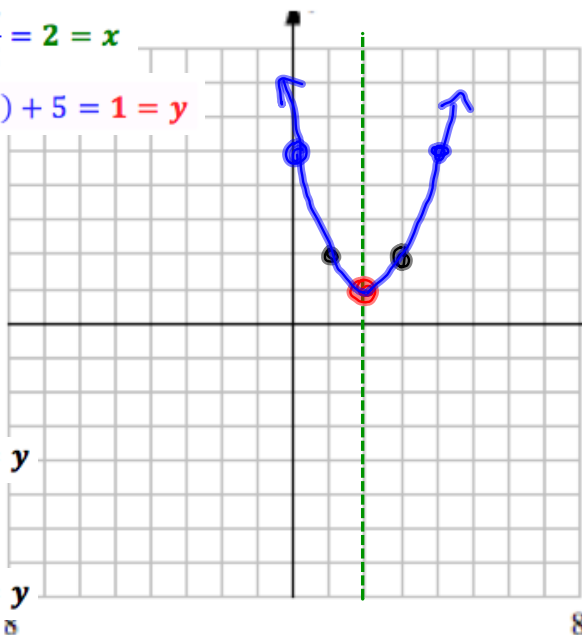
~~d) Roots ( , ) ( , )~~

e)

x	y
0	5
1	2
2	1
3	2
4	5

$y = (1)^2 - 4(1) + 5 = 2 = y$

$y = (3)^2 - 4(3) + 5 = 2 = y$



f) Domain:  $x = \mathbb{R}$

Range:  $y \geq 1$

g) Max or Min =  $y = 1$

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

a) Find the a.o.s. =  $x = \frac{-b}{2a} = \frac{-4}{2(-1)} = \frac{-4}{-2} = 2 = x$

b) Vertex: (2, 7)  $y = -(2)^2 + 4(2) + 3 = 7 = y$

c) Y intercept (0, 3)

d) Roots (-0.65, 0) | (4.65, 0)

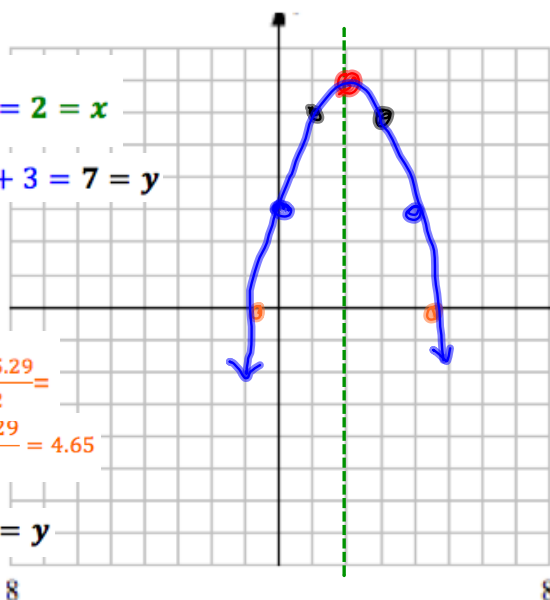
$$\frac{-4 \pm \sqrt{(4)^2 - 4(-1)(3)}}{2(-1)} = \frac{-4 \pm \sqrt{16+12}}{-2} = \frac{-4 \pm \sqrt{28}}{-2} = \frac{-4 \pm 5.29}{-2}$$

$$\frac{-4 + 5.29}{-2} = -0.65 \text{ or } \frac{-4 - 5.29}{-2} = 4.65$$

1	6
ver	tex
3	6

$y = -(1)^2 + 4(1) + 3 = 6 = y$

$y = -(3)^2 + 4(3) + 3 = 6 = y$



f) Domain:  $x = \mathbb{R}$

Range:  $y \leq 7$

g) Max or Min =  $y = 7$

3.  $f(x) = x^2 - 6x$

a) Find the a.o.s. =  $-\frac{b}{2a} = -\frac{-6}{2(1)} = \frac{6}{2} = 3 = x$

b) Vertex:  $(3, -9)$   $y = (3)^2 - 6(3) = 9 - 18 = -9 = y$

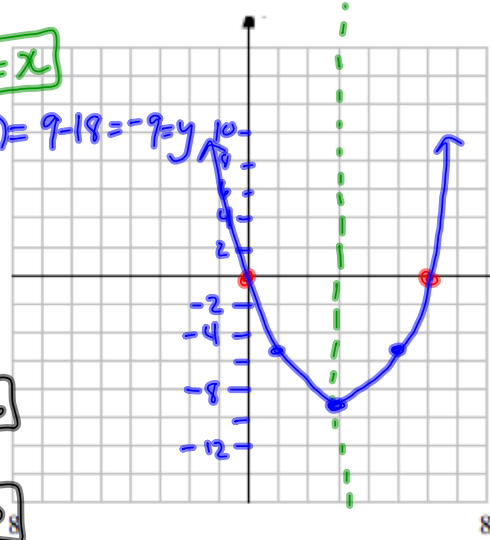
c) Y intercept  $(0, 0)$

d) Roots  $(6, 0)$   $(0, 0)$

e) 
$$\frac{-(-6) \pm \sqrt{(-6)^2 - 4(1)(0)}}{2(1)}$$

x	y
0	0
1	-5
5	-5
6	0

$(1)^2 - 6(1)$   
 $(5)^2 - 6(5)$



f) Domain:  $x = \mathbb{R}$

g) Range:  $y \geq -9$

g) Max or Min =  $y = -9$

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

a) Find the a.o.s. =  $-\frac{b}{2a} = -\frac{-5}{2(2)} = \frac{5}{4} = 1.25 = x$

b) Vertex:  $(1.25, -7.125)$   
 $2(1.25)^2 - 5(1.25) - 4$

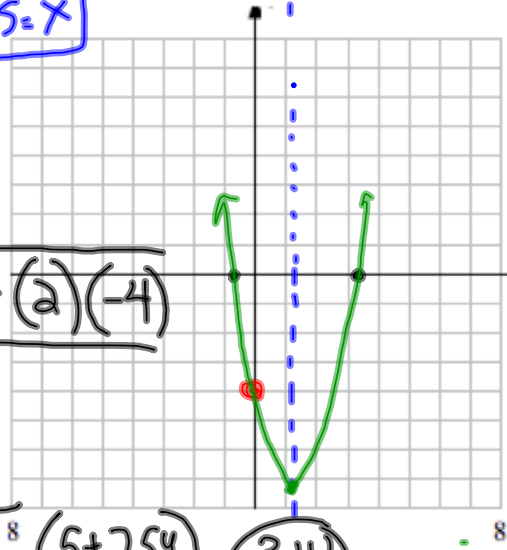
c) Y intercept  $(0, -4)$

d) Roots  $(4, 0)$   $(-0.65, 0)$

e) 
$$\frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-4)}}{2(2)}$$

x	y
4	8

$5 \pm \sqrt{25 + 32}$   
 $5 \pm 7.54$   
 $\frac{5 + 7.54}{4} = 3.14$   
 $\frac{5 - 7.54}{4} = -0.65$



f) Domain:

g) Range:  $y \geq -7.125$

g) Max or Min =  $y = -7.125$

$2(4)^2 - 5(4) - 4 = 8$   
 $x = \mathbb{R}$