Today's Plan:

Learning Target (standard): I will graph quadratic equations using the 6-step process.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.352 #28-80 (by 4)

$28) I_x : (-2,0) \,\&\, (0,0)$

$32) I_x : \left(-\frac{3}{4},0\right) \,\&\, (-2,0)$

$36) I_x : (-4,0) \,\&\, \left(\frac{-7}{3},0\right)$

$40) I_x : \left(-\frac{1}{2},0\right) \,\&\, (1,0)$

$44) I_x : -$

$48) I_x : \left(2+\sqrt{5},0\right) \,\&\, \left(2-\sqrt{5},0\right)$

$52) I_x : \left(3+\sqrt{2},0\right) \,\&\, \left(3-\sqrt{2},0\right)$

56) two x-intercepts

60) one x-intercept

64) no x-intercepts

68) one x-intercept

72) no x-intercepts

76) no x-intercepts

80) no x-intercepts

State the number of x-intercepts and find them if they exist. Also, find the vertex.

$y = 2x^2 - 4x$

$a=2$
$b=-4$
$c=0$

b^2-4ac
$(-4)^2-4(2)(0)$
$16>0$ 2 Ix

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$
$=\frac{4\pm\sqrt{16}}{2(2)}$
$=\frac{4\pm4}{4}$
$=\frac{4+4}{4}, \frac{4-4}{4}$
$x=2,0$
Ix: $(2,0), (0,0)$

State the number of x-intercepts and find them if they exist. Also, find the vertex.

$y = 6x^2 + 7x + 2$

$a=6$
$b=7$
$c=2$

b^2-4ac
$7^2-4(6)(2)$
$49-48$
$1>0$ 2 Ix

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2(a)}$
$=\frac{-7\pm\sqrt{1}}{2(6)}$
$=\frac{-7\pm1}{12}$
$x=\frac{-7+1}{12}, \frac{-7-1}{12}$
$x=-\frac{1}{2}, -\frac{2}{3}$
Ix: $(-\frac{1}{2},0), (-\frac{2}{3},0)$

State the number of x-intercepts and find them if they exist. Also, find the vertex.

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

$a=-1$

$b=-2$

$c=1$

b^2-4ac

$(-2)^2-4(-1)(1)$

$4+4$

$8>0$ 2 Ix

$8 = 4 \cdot 2 = 2\sqrt{2}$

$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$

$=\frac{2\pm\sqrt{8}}{2(-1)}$

$\div 2$

$=\frac{2\pm 2\sqrt{2}}{-2}$

$x=-1\pm\sqrt{2}$

Ix: $(-1+\sqrt{2},0),(-1-\sqrt{2},0)$

Properties of Quadratic Equations: Process for Graphing

1) direction the parabola opens:

$$f(x)=a(x-h)^2+k$$ - vertex form

$$f(x)=ax^2+bx+c$$ - standard

$a>0$ - opens up → minimum

$a<0$ - opens down → maximum

Properties of Quadratic Equations:

2) vertex:

$$f(x) = a(x-h)^2 + k$$

opposite

same

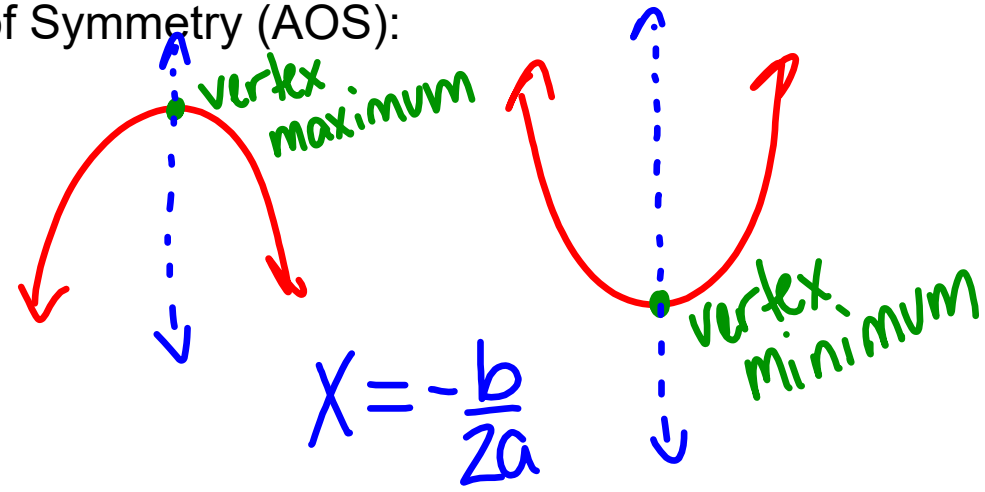
vertex: (h, k)

$$f(x) = ax^2 + bx + c$$

$x = \frac{-b}{2a}$ ← plug in to get y

Properties of Quadratic Equations:

3) Axis of Symmetry (AOS):



$X = \frac{-b}{2a}$

Properties of Quadratic Equations:

4) Use the discriminant to state the number of x-intercepts and find them, if they exist.

$$y = 2x^2 - 1$$

$a=2$ $b=0$ $c=-1$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$b^2 - 4ac$$

$$0 - 4(2)(-1)$$

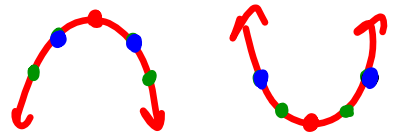
$$8 > 0$$

$$2I_x$$

$$I_x : \left(-\frac{\sqrt{2}}{2}, 0\right), \left(\frac{\sqrt{2}}{2}, 0\right)$$

Properties of Quadratic Equations:

5) *t*-chart



X	Y
Vertex	

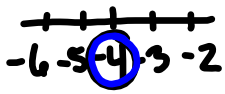
left

right

vertex "x"

vertex: (-4, 7)

X	Y
-6	
-5	
-4	7
-3	
-2	



*plug in x to get y

6) graph

Graphing Quadratic Equations:

$y = 2x^2 - 1$ a=2 b=0

"6-Step Process"

① a=+ c=-1

opens up → minimum

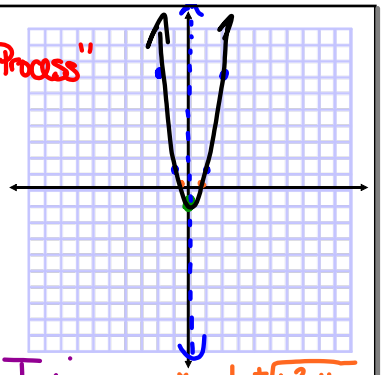
② vertex: $(0,-1)$

$x = -\frac{b}{2a} = \frac{0}{2(2)} = \frac{0}{4} = 0$

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

$y = -1$

③ AOS: $x = 0$



4) I_x:

$b^2 - 4ac$

$0^2 - 4(2)(-1)$

$0 + 8$

$8 > 0$ 2 I_x

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$= \frac{0 \pm \sqrt{8}}{2(2)}$

8 → 4, 2 → $2\sqrt{2}$

$= \frac{\pm 2\sqrt{2}}{4}$

$x = \frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}$

I_x: $(\frac{\sqrt{2}}{2}, 0), (-\frac{\sqrt{2}}{2}, 0)$

$\approx .707$ $\approx -.707$

5)

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

-2 -1 0 1 2

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

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

Assignment:

p.351 #4-12 even

Graph using the 6-step process