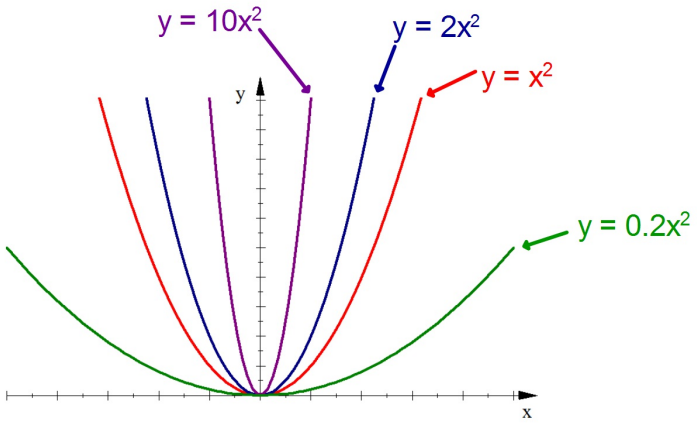
Graphs of a parabolas Exploration

Part 1 $Y = ax^2$



$Y = ax^2$

The larger the value of $|a|$..... the more narrow the parabola.

The smaller the value of $|a|$..... the wider the parabola.

If $a<0$ then the parabola is upside down (x-axis reflection)

$Y = ax^2$

Actually the parabolas don't get wider or narrower

they get taller and shorter.....

a is a Vertical Stretch or Vertical Shrink Factor

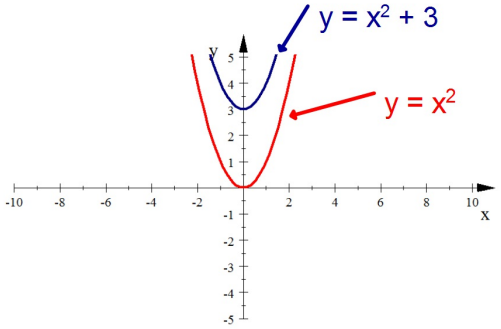
Since our textbook uses the terms WIDE and NARROW that is how we will refer to it.

Finish this sentence: The closer the value of a is to zero the Wider the parabola.

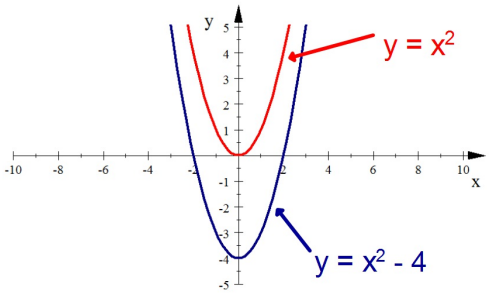
Finish this sentence: The further the value of a is from zero the Narrower the parabola.

Part 2 of the Exploration

$$Y = x^2 \pm c$$



Graph shifted
3 units up.



Graph shifted
4 units down.

$Y = x^2 \pm c$

The value of c shifts the graph up or down:

+c moves it up c units
-c moves it down c units

The graph of $y=ax^2 + c$

a	a>0	a<0
	Opens Up	Opens Down
	smaller a	bigger a
	Wider	Narrower
c	c>0	c<0
	Moves Up	Moves Down

Vertex (0 , c)

The graph of $y=ax^2 + c$

Vertex (0 , c)

Since the vertex is (0,c), then c is also the y-intercept

Without using a calculator, match each equation below with its graph.

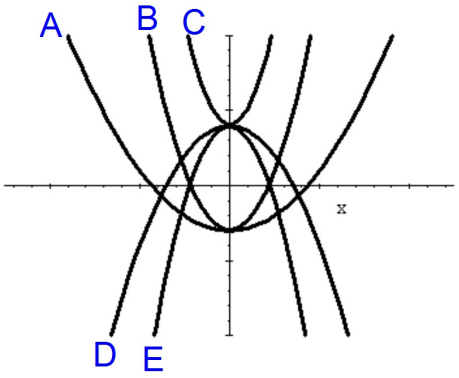
B 1. $y = 4x^2 - 3$

D 2. $y = -2x^2 + 4$

A 3. $y = x^2 - 3$

E 4. $y = -5x^2 + 4$

C 5. $y = 7x^2 + 4$



Match each equation to its graph.

E 1. $y=-3x^2 -2$

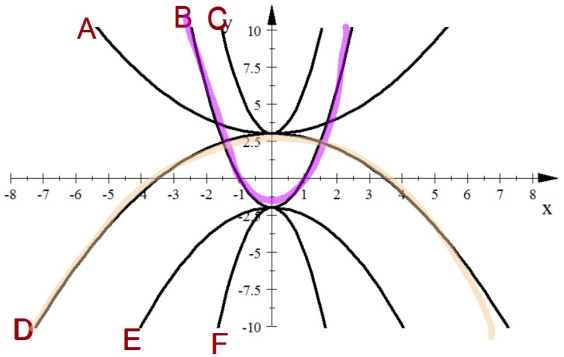
B 2. $y=2x^2 -2$

A 3. $y=0.25x^2 +3$

D 4. $y= -0.25x^2 +3$

E 5. $y= -0.5x^2 -2$

C 6. $y=3x^2 +3$

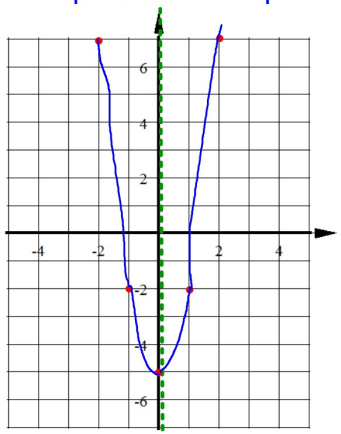


Find the coordinates of the vertex and the equation of the LOS for each quadratic.

Equation	Vertex	Eq of LOS
1. $y = x^2 - 3$	(0, -3)	X = 0
2. $y = 5x^2 + 7$	(0, 7)	X = 0

Graph each of the parabolas with with at least five points.

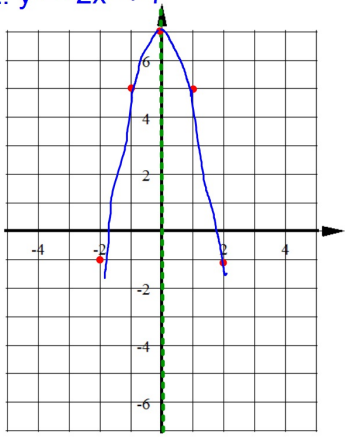
1. $y = 3x^2 - 5$



Vertex (0, -5) LOS X = 0

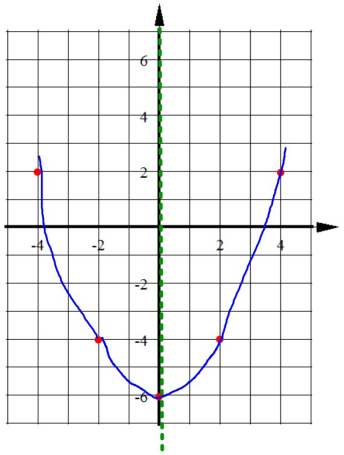
X	Y
1	-2
2	7

2. $y = -2x^2 + 7$



Vertex (0, 7) LOS X = 0

X	Y
1	5
2	-1



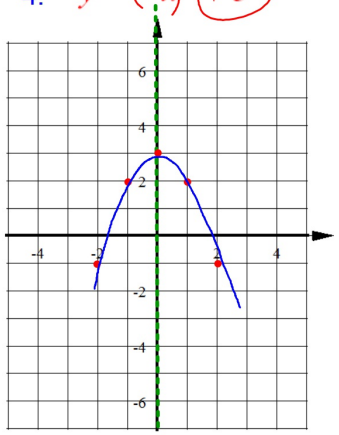
3. $y = \frac{1}{2}x^2 - 6$

Vertex $(0, -6)$ LOS $x = 0$

X	Y
2	-4
4	2

Use even numbers for x so that when you divide by two you get integer values for y.

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



Vertex $(0, 3)$ LOS $x = 0$

X	Y
1	2
2	-1

You can now do Hwk #25

Pages 513-515

Problems 1, 2, 7, 9, 12, 13, 15, 21-26, 46

Use the sheet of paper I've already printed out.