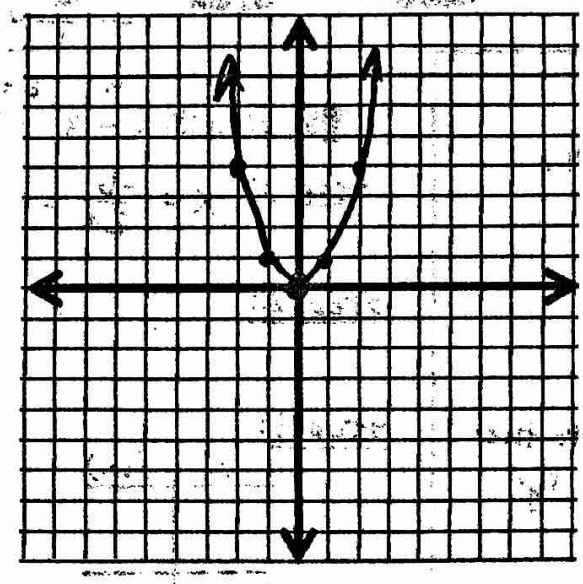
What does the Parent Quadratic Function look like?

$y = x^2$

x	f(x)
-2	4
-1	1
0	0
1	1
2	4



parabola:
"U" shape
axis of symmetry:

$\frac{0}{2(1)} = \frac{0}{2} = 0 \quad x = 0$

vertex:
(0,0)
$y = (0)^2 = 0$

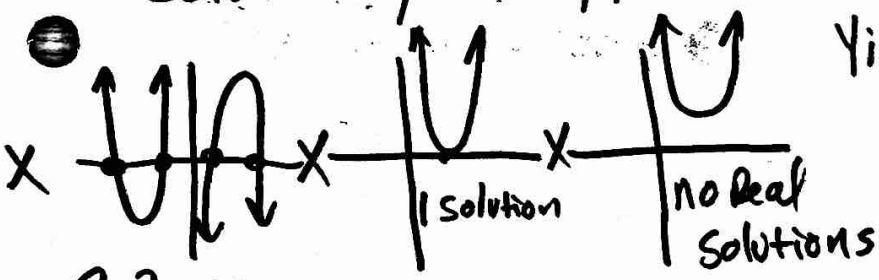
yint = (0,0) D: ℝ R: $y \geq 0$

$x^2 - 4x + 7 = 0$

3 Solve $x^2 + 7 = 4x$ by graphing.

4 Find the zeros of $f(x) = 4x^2 - 4x + 1$

Solutions/Zero's/Roots



2 Zero's
Roots
Real

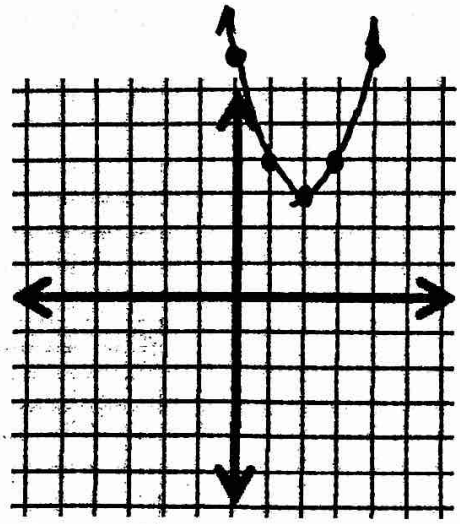
- up
yint: (0,1)
V(.5,0)

$a=4 \quad b=-4 \quad c=1$

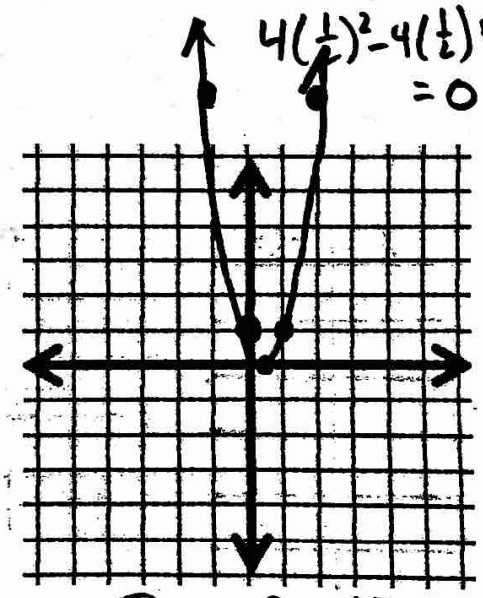
$y = \frac{4}{2(4)} = \frac{4}{8} = \frac{1}{2}$

$(\frac{1}{2}, 0)$

$4(\frac{1}{2})^2 - 4(\frac{1}{2}) + 1 = 0$



V(2,3)
yint (0,7
no Sol.



D: ℝ R: $y \geq 0$

Solve Quadratics by Graphing

How do you graph a quadratic equation in standard form?

$$y = ax^2 + bx^1 + c$$

mandatory

constant "just a #" → y-intercept

Step 1:
Find the axis of symmetry.

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

Step 2:
Find the vertex.

Sub in 'X' (from step 1) to the original equation to get 'y'.

Step 3:
Make a table.

Choose at least two points to the left & right of the A.o.S.

ax^2 → +a opens up; −a opens down

1 Graph $y = 1x^2 - 2x - 3$

$a=1$ $b=-2$ $c=-3$ $(0,c)$

Step 1: $x = \frac{-b}{2a} = \frac{+2}{2(1)} = \frac{2}{2} = 1$ $\boxed{x=1}$

Step 2: $(1,-4)$

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

$1-2-3 = \boxed{-4}$

Step 3: $-1-3$

x	f(x)
-1	0
0	-3
1	-4
2	-3
3	0

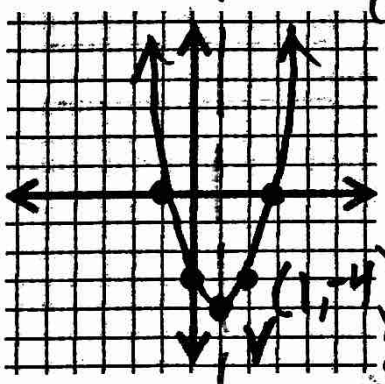
vertex →

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

$+1+2$

$3-3=0$

Yint = −3 (0,−3)



D: ℝ R: $y \geq -4$

2 Graph $y = 2x^2 - 8x + 6$

$a=2$ $b=-8$ $c=6$

up/down

a.o.s. $x = \frac{-b}{2a} = \frac{+8}{2(2)} = \frac{8}{4} = 2$

$\boxed{x=2}$

Yint: (0,6)

Vertex (2,−2)

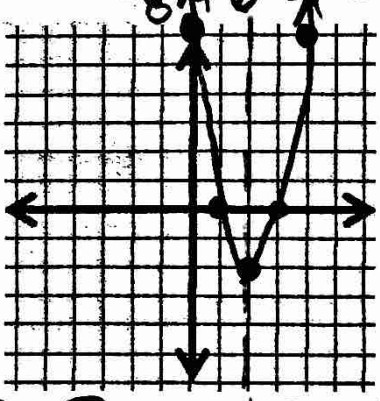
$2(2)^2 - 8(2) + 6$

$8 - 16$

$-8 + 6 = -2$

x	f(x)
0	6
1	0
2	-2
3	0
4	6

vertex



$2(1)^2 - 8(1) + 6$

$2 - 8$

$-6 + 6 = 0$

D: ℝ R: $y \geq -2$

3 Graph $y = \frac{1}{2}x^2 + 2x + 3$

$a = \frac{1}{2}$ $b=2$ $c=3$

up/Down

Yint (0,3)

Calculator

$\boxed{Y=}$ $.5x^2+2x+3$

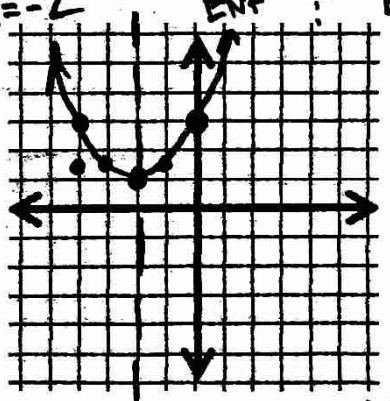
Max Min 2ND Trace

#4 #3 #3

V(−2,1)

X=−2

LB ENT RB ENT



2ND graph

Graph $y = ax^2 + bx + c$