ALGEBRA RH for ZOOM

1)

a) Graph $y = x^2 - 2x - 3$.

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

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

b) Determine the coordinates of the vertex. (1, -4)

c) State whether the vertex is a *maximum* or a *minimum* point. minimum

posite "a" value turns up

d) State the **roots** of the parabola. {-1, 3}

$0 = (x-3)(x+1)$

$x-3=0$ | $x+1=0$

$x=3$ | $x=-1$

e) State the **y-intercept**. -3 the constant

f) State the **domain** of the function. $(-\infty, \infty)$

g) State the **range** of the function. $[-4, \infty)$

h) State the *interval* for the function is **increasing**. $(1, \infty)$

x values

i) State the *interval* for the function is **decreasing**. $(-\infty, 1)$

can't include the beginning or ending points

j) Describe the **end behavior** of the function. approach ∞

[where the arrows point

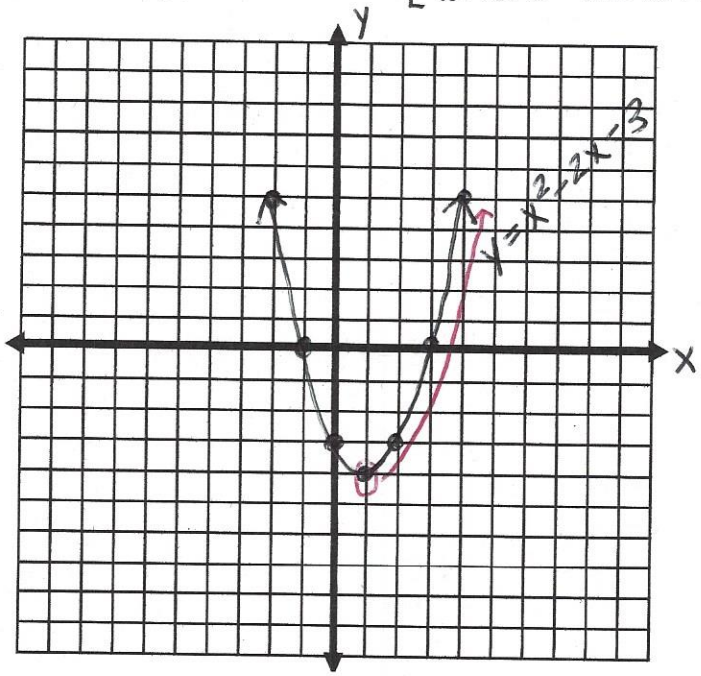
unless you have a restricted domain, you do not have to graph every point from your TOV

x	y
-3	12
-2	5
-1	0
0	-3
1	-4
2	-3
3	0

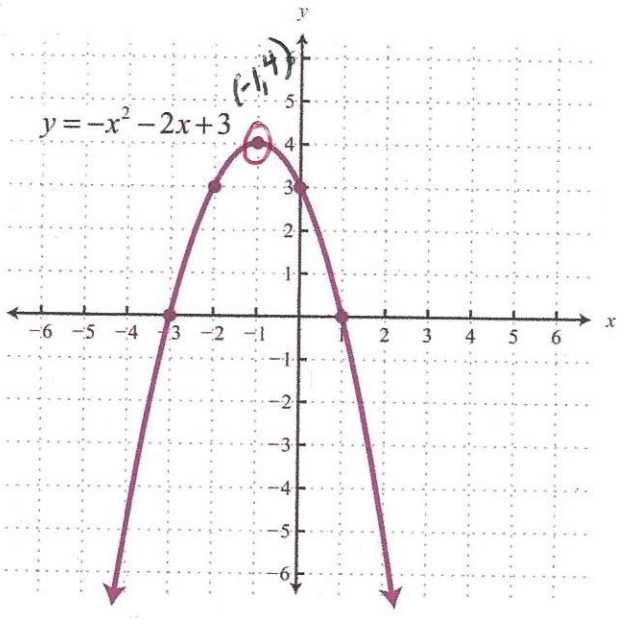
vertex

middle part of table

4 5



2) Examine the function pictured below and complete a – d.



x values

a) State the *interval* for the function is **increasing**. $(-\infty, -1)$

b) State the *interval* for the function is **decreasing**. $(-1, \infty)$

y values

c) State the **range** of the function. $(-\infty, 4]$

d) State the y-intercept. 3

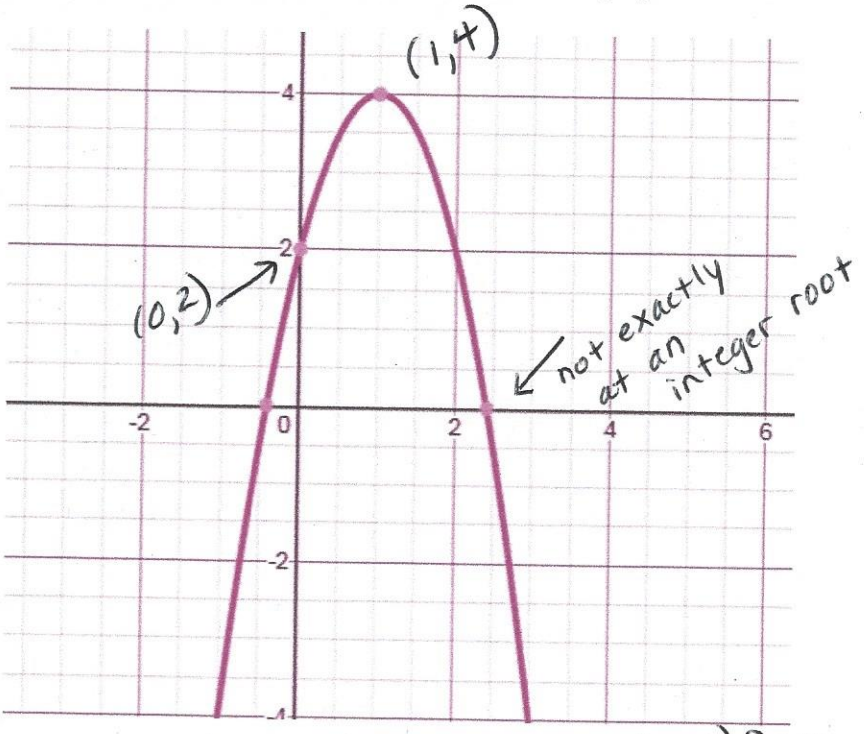
Quadratic Functions can be written in different forms.

Standard Form	**Factored Form**	**Vertex Form**
$y = ax^2 + bx + c$	$y = a(x - r_1)(x - r_2)$	$y = a(x - h)^2 + k$
c: y-intercept	**Roots:** $\{r_1, r_2\}$	**Vertex:** (h, k)

Rewrite the quadratic functions in *factored form* and in *vertex form*. State the *zeros* and the *vertex* of the function.

$y = x^2 - 2x - 3$	$y = x^2 - 18x - 40$
Factored Form $y = (x-3)(x+1)$ $x-3=0 \mid x+1=0$ $x=3 \mid x=-1$ **Zeros:** $\{-1, 3\}$	**Factored Form** $y = (x-20)(x+2)$ $x-20=0 \mid x+2=0$ $x=20 \mid x=-2$ **Zeros:** $\{-2, 20\}$
Vertex Form $y = x^2 - 2x - 3$ $y + 3 = x^2 - 2x$ $\left(\frac{-2}{2}\right)^2$ $y + 3 + 1 = x^2 - 2x + 1$ $y + 4 = (x-1)^2$ $y = (x-1)^2 - 4$ **Vertex:** $(1, -4)$	**Vertex Form** $y = x^2 - 18x - 40$ $y + 40 = x^2 - 18x$ $\left(\frac{-18}{2}\right)^2$ $y + 40 + 81 = x^2 - 18x + 81$ $y + 121 = (x-9)^2$ $y = (x-9)^2 - 121$ **Vertex:** $(9, -121)$

Write an equation of each quadratic shown graphed below



Final equation : $y = -2(x-1)^2+4$

vertex $(1,4)$

vertex form

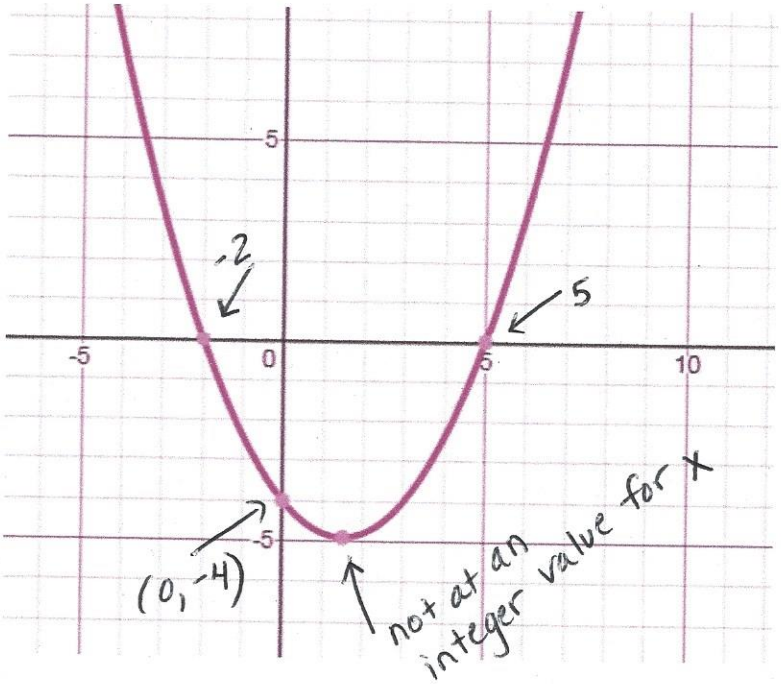
$y = a(x-1)^2+4$

to find "a", use a point with the vertex form above $(0,2)$

$2 = a(0-1)^2+4$

$2 = a(1)+4$

$-2 = a$



Final equation :

$y = \frac{2}{5}(x+2)(x-5)$

use factored form

roots : $-2, 5$

$y = a(x+2)(x-5)$

use y intercept, $(0,-4)$ to find "a"

$-4 = a(0+2)(0-5)$

$-4 = a(2)(-5)$

$-4 = -10a$

$\frac{-4}{-10} = a$

$\frac{2}{5} = a$