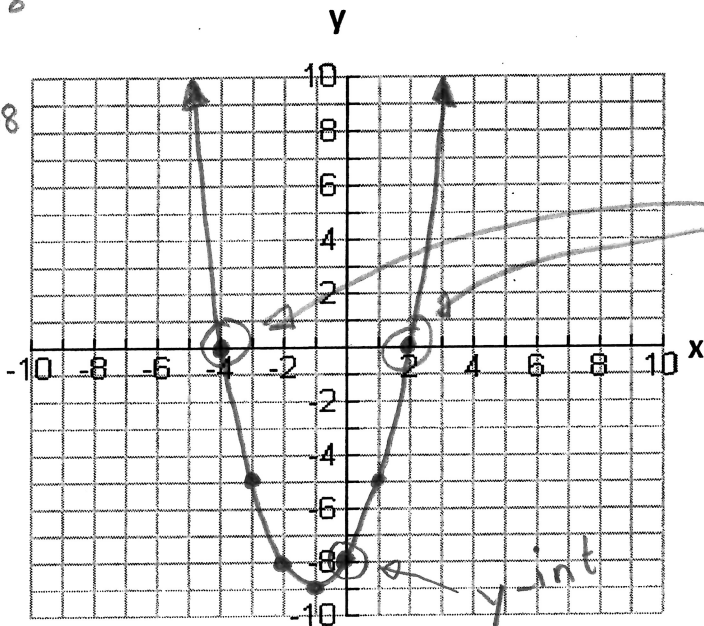


Factored Form of a Quadratic Equation

1. Complete the table of values and graph the equation $y = x^2 + 2x - 8$. Label the axis of symmetry, vertex, and min/max.

x	y
-4	0
-3	-5
-2	-8
-1	-9
0	-8
1	-5
2	0

$(-4)^2 + 2(-4) - 8$
 $= 16 - 8 - 8$
 $= 0$
 $(-3)^2 + 2(-3) - 8$
 $= 9 - 6 - 8$
 $= -5$



2. What is the y-intercept?

$y\text{-int} = -8$

Note: When a quadratic equation is expressed in "standard form" $y = ax^2 + bx + c$, the constant c is the y-intercept.

3. Factor the equation $y = x^2 + 2x - 8$ to get $y = (x+4)(x-2)$.

This is called the Factored form of a quadratic equation.

4. From the above graph, what were the x-ints? -4 and 2.

Note: When a quadratic equation is expressed in "factored form" $y = a(x-r)(x-s)$, the constants r and s represent the x-intercepts.

Example

Determine the x-int(s) and y-int for each quadratic equation:

a) $y = x^2 + 4x - 5$ ← Standard Form

factored form → $y = (x+5)(x-1)$
 x-ints: -5, 1
 y-int: -5

b) $y = 2x^2 - 6x - 20$

$y = 2x^2 - 6x - 20$ ← standard form

$y = 2(x^2 - 3x - 10)$

$y = 2(x-5)(x+2)$ ← factored form

x-ints: 5, -2

y-int: -20

Practice/ Homework

For each quadratic equation:

- Write the factored form of the equation.
- Determine the x-int(s) and y-int.
- Complete the table of values.
- Graph the function.
- Label the vertex as min/max.

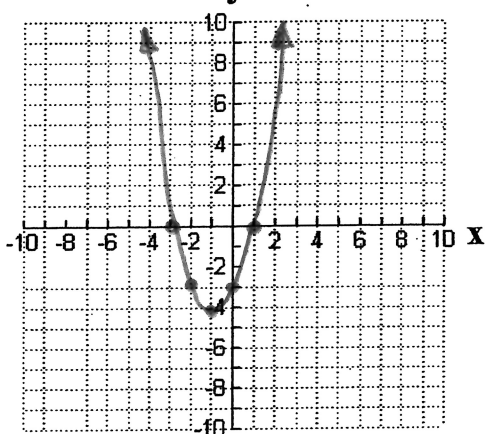
a) $y = x^2 + 2x - 3$

Factored Form: $y = (x+3)(x-1)$

y-int: -3

x-int(s): -3 and 1

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



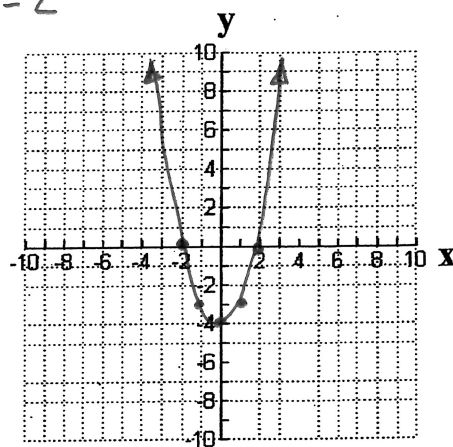
b) $y = x^2 - 4$

Factored Form: $y = (x-2)(x+2)$

y-int: -4

x-int(s): ± 2

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



c) $y = x^2 - 2x - 8$

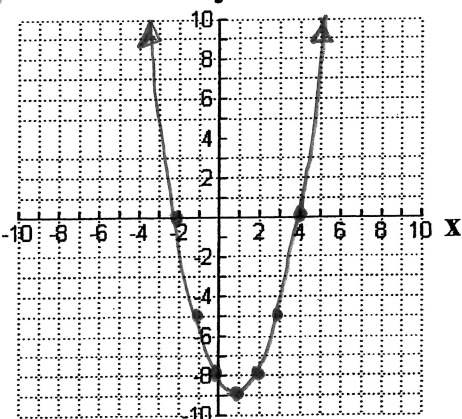
$16 - 8 - 8$

Factored Form: $y = (x-4)(x+2)$

y-int: -8

x-int(s): 4, -2

x	y
-2	0
-1	-5
0	-8
1	-9
2	-8
3	-5
4	0



d) $y = x^2 - 6x + 5$

Factored Form: $y = (x-1)(x-5)$

y-int: 5

x-int(s): 1 and 5

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

