

5.5 Graphing from Intercept Form

What information do you need in order to graph a quadratic function? Vertex & a-value

* The x-intercepts represent the solutions to the equation

INTERCEPT FORM:

$$y = a(x - p)(x - q)$$

Opposite

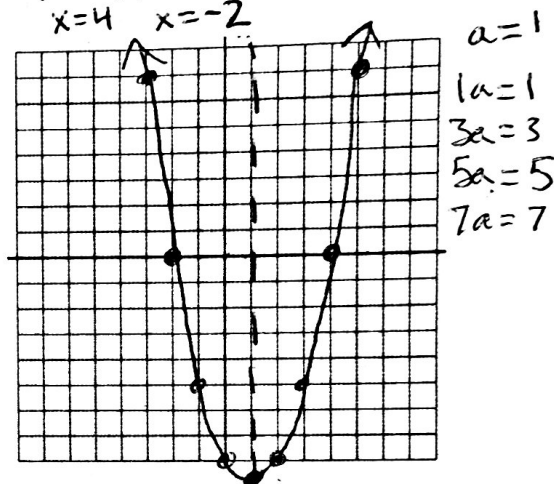
p & q represent the x-intercepts

Let's practice graphing a parabola from intercept form:

How to find the Vertex in Intercept Form:

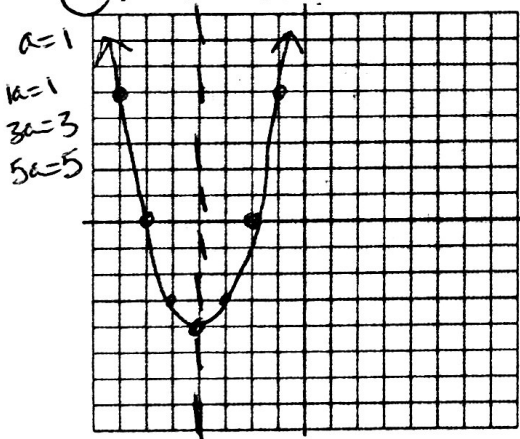
- 1) Find & plot x-intercepts
- 2) Find axis of symmetry by going halfway between x-intercepts
- 3) Plug in axis of symmetry into equation to get y of vertex
ex: $x=1$ $y = (1-4)(1+2)$
 $= -9$
Vertex: $(1, -9)$

Graph $y = (x - 4)(x + 2)$



Example 1: Graph the following quadratic equations

a) $y = (x + 2)(x + 6)$



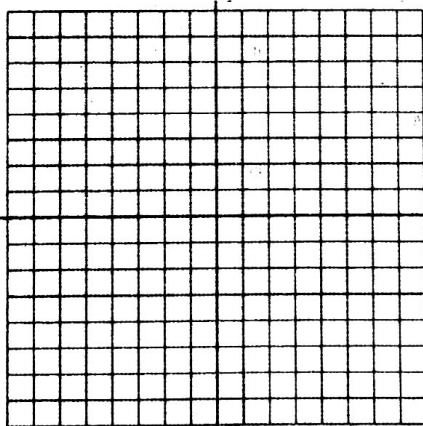
$$x = -4 \quad y = (-4+2)(-4+6)$$

$$= (-2)(2)$$

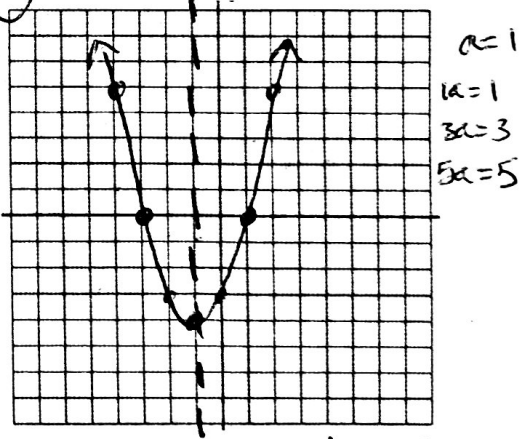
$$= -4$$

Vertex $(-4, -4)$

b) $y = x(x - 8)$



c) $y = (x - 1)(x + 3)$



$$x = -1 \quad y = (-1-1)(-1+3)$$

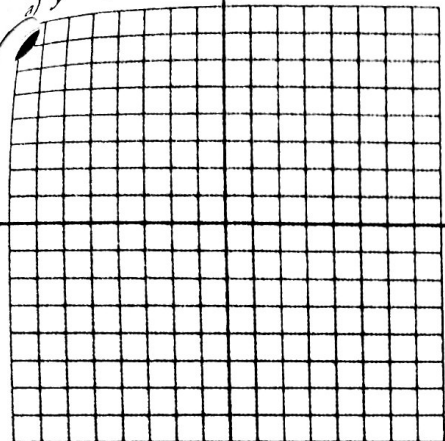
$$= (-2)(2)$$

$$= -4$$

Vertex $(-1, -4)$

Example 2: Graph the following quadratic equations

a) $y = (x - 5)(x - 1)$

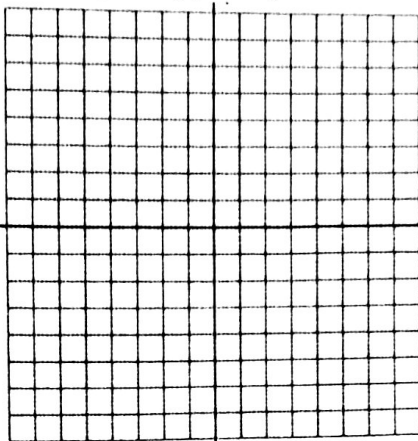


x-intercept(s):

Vertex:

$y = 2(1)(1-2) = -2$
 $x=0 \quad x=2$

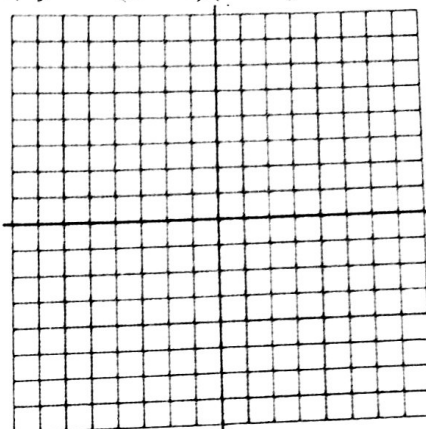
b) $y = (x - 3)(x - 5)$



x-intercept(s):

Vertex:

c) $y = -(x - 3)(x - 1)$



x-intercept(s):

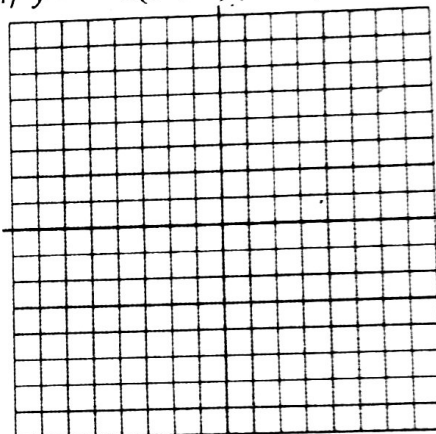
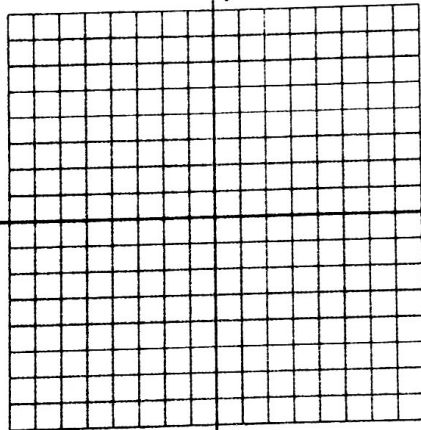
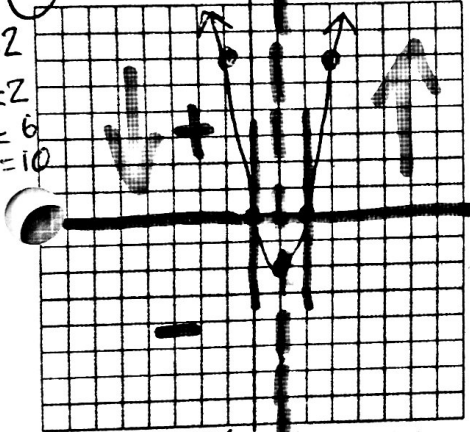
Vertex:

d) $y = 2x(x - 2) = 2(x+0)(x-2)$

e) $y = (x + 2)(x - 2)$

f) $y = -2(x + 4)(x + 2)$

$a=2$
 $1a=2$
 $3a=6$
 $5a=10$



x-intercept(s): $(0, 0), (2, 0)$

y-intercept: $(0, 0)$

Axis of Symmetry: $x = 1$

Vertex: $(1, -2)$

Max/min value: -2

Domain: $(-\infty, \infty)$

Range: $[-2, \infty)$

Increasing: $(1, \infty)$

Decreasing: $(-\infty, 1)$

Positive: $(-\infty, 0) \cup (2, \infty)$

Negative: $(0, 2)$

End behavior:

As $x \rightarrow \infty, y \rightarrow \infty$

As $x \rightarrow -\infty, y \rightarrow \infty$

x-intercept(s):

y-intercept:

Axis of Symmetry:

Vertex:

Max/min value:

Domain:

Range:

Increasing:

Decreasing:

Positive:

Negative:

End behavior:

x-intercept(s):

y-intercept:

Axis of Symmetry:

Vertex:

Max/min value:

Domain:

Range:

Increasing:

Decreasing:

Positive:

Negative:

End behavior: