

# Intercept Form – Notes and Practice

Name: Hirsch

How would you find the vertex when in intercept form?

Example:  $y = (x + 2)(x - 4)$

Find the x-intercepts:  
Set each Factor equal to 0 and solve for x.

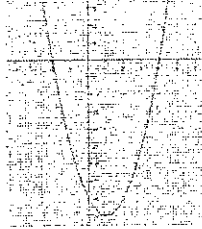
$(-2, 0) \text{ \& } (4, 0)$

Find the Axis of Symmetry:  
Find the 1/2 point between the x-intercepts.

$x = \frac{-2+4}{2} = \frac{2}{2} = 1$   $x = 1$

Find the Vertex:  
Plug the x-value of the AOS into equation to get the y-value

$y = (1+2)(1-4)$   
 $= (3)(-3) = -9$   
Vertex  $(1, -9)$



Find the x-intercepts and the vertex of the following in Intercept Form:

1.  $y = (x - 6)(x + 4)$

x-int:  $(6, 0) \text{ \& } (-4, 0)$

AOS:  $x = 1$

Vertex:  $(1, -25)$

2.  $y = -(x + 3)(x - 5)$

x-int:  $(-3, 0) \text{ \& } (5, 0)$

AOS:  $x = 1$

Vertex:  $(1, 16)$

$x = \frac{6+(-4)}{2} = \frac{2}{2} = 1$

$y = (1-6)(1+4)$   
 $(-5)(5) = -25$

$x = \frac{-3+5}{2} = \frac{2}{2} = 1$

$y = -(1+3)(1-5)$   
 $= -(4)(-4) = 16$

Find the x-intercepts and the vertex of the following in Intercept Form: You Practice:

3.  $y = 2(x + 7)(x + 3)$

x-int:  $(-7, 0) \text{ \& } (-3, 0)$

AOS:  $x = -5$

Vertex:  $(-5, -8)$

4.  $y = -(x - 8)(x - 2)$

x-int:  $(8, 0) \text{ \& } (2, 0)$

AOS:  $x = 5$

Vertex:  $(5, 9)$

$x = \frac{-7+(-3)}{2} = \frac{-10}{2} = -5$

$x = \frac{8+2}{2} = \frac{10}{2} = 5$

$y = 2(-5+7)(-5+3)$   
 $2(2)(-2) = -8$

$y = -(5-8)(5-2)$   
 $-(-3)(3) = 9$

Graph the following in Intercept Form:

5.  $y = (x - 1)(x + 5)$

Direction: up

x-intercepts:  $(1, 0) \text{ \& } (-5, 0)$

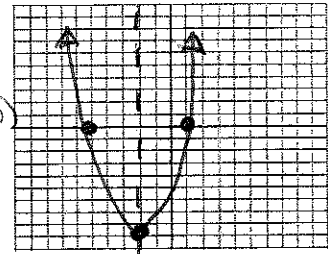
AOS:  $x = -2$

Vertex:  $(-2, -9)$

y-intercepts:  $(0, -5)$

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

Range:  $[-9, \infty)$



$x = \frac{1+(-5)}{2} = \frac{-4}{2} = -2$

$y = (-2-1)(-2+5)$   
 $y = (-3)(3) = -9$

y-int  
 $(x-1)(x+5)$   
 $x^2 + 5x - x - 5$   
 $x^2 + 4x - 5$

Graph the following in Intercept Form: You Practice:

6.  $y = 2(x + 1)(x - 3)$

Direction: up

x-intercepts:  $(-1, 0) \text{ \& } (3, 0)$

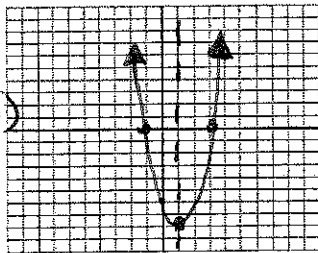
AOS:  $x = 1$

Vertex:  $(1, -8)$

y-intercepts:  $(0, -6)$

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

Range:  $[-8, \infty)$



$x = \frac{-1+3}{2} = 1$

$y = 2(1+1)(1-3) = -8$

y-int:  
 $2(0+1)(0-3) = -6$

Graph the following in Intercept Form: Ticket Out the Door:

7.  $y = -2(x + 3)(x - 1)$

Direction: Down

x-intercepts:  $(-3, 0) \text{ \& } (1, 0)$

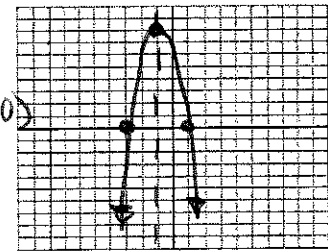
AOS:  $x = -1$

Vertex:  $(-1, 8)$

y-intercepts:  $(0, 6)$

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

Range:  $(-\infty, 8]$



$x = \frac{-3+1}{2} = -1$

$y = -2(-1+3)(-1-1) = 8$

y-int =  
 $-2(0+3)(0-1) = 6$