Key

Converting from Vertex to Standard Form

Steps: 1. Make a box to multiply for what is in parenthesis
2. Multiply the a
3. Add/Subtract the constant

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

	x	4
x	x^2	$4x$
4	$4x$	16

$2(x^2+8x+16) - 4$

$2x^2 + 16x + 32 - 4$

$2x^2 + 16x + 28$

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

	x	2
x	x^2	$2x$
2	$2x$	4

$-3(x^2+4x+4) + 5$

$-3x^2 - 12x - 12 + 5$

$-3x^2 - 12x - 7$

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

	x	-1
x	x^2	$-1x$
-1	$-1x$	1

$-(x^2 - 2x + 1) - 1$

$-x^2 + 2x - 1 - 1$

$-x^2 + 2x - 2$

4. $y = 5(x+7)^2 - 12$

	x	7
x	x^2	$7x$
7	$7x$	49

$5(x^2 + 14x + 49) - 12$

$5x^2 + 70x + 245 - 12$

$5x^2 + 70x + 233$

Converting from Standard to Vertex Form

Steps: 1. $x = \frac{-b}{2a}$
2. Substitute x into equation to get y
3 Write it in vertex form: $a(x-h)^2 + k$

1. $y = 2x^2 - 4x + 6$

a: 2
b: -4
c: 6

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

$y = 4$

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

2. $y = 3x^2 - 12x + 5$

a: 3
b: -12
c: 5

$x = \frac{12}{2(3)} = \frac{12}{6} = 2$

$y = -7$

$y = 3(x-2)^2 - 7$

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

a: -1
b: -2
c: -1

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

$y = 0$

$y = -1(x+1)^2 + 0$

4. $y = 5x^2 - 12$

a: 5
b: 0
c: -12

$x = \frac{0}{2(5)} = \frac{0}{10} = 0$

$y = -12$

$y = 5(x-0)^2 - 12$