

Standard Form

remember yesterday vertex form is $y = a(x-h)^2 + k$

standard form: $y = ax^2 + bx + c$

this is a polynomial:
terms all have positive integer exponents.

* the a values are the same in VF & SF

[ex] $y = 3x^2 + 2x + 1$ is in standard form

your book calls this general form

how do I go from VF to SF?

you "double distribute" which when there's two things being multiplied, it's called FOILING.

Front
Outside
Inside
Last

how it works

$$1. (x+2)(2x-1) = \underbrace{2x(x)}_F + \underbrace{(-1)(x)}_O + \underbrace{2(2x)}_I + \underbrace{2(-1)}_L$$
$$= 2x^2 - x + 4x - 2$$
$$= \boxed{2x^2 + 3x - 2}$$

$$2. (x-4)(x-4) = \underbrace{x(x)}_F + \underbrace{(-4)(x)}_O + \underbrace{(-4)(x)}_I + \underbrace{(-4)(-4)}_L$$
$$= x^2 - 4x - 4x + 16$$
$$= \boxed{x^2 - 8x + 16}$$

Vertex form \rightarrow standard form

[ex] $y = 3(x-1)^2 - 5$ VF

1. $y = 3(x-1)(x-1) - 5$

2. $y = 3(x^2 - x - x + 1) - 5$

3. $y = 3(x^2 - 2x + 1) - 5$

4. $y = 3x^2 - 6x + 3 - 5$

5. $y = 3x^2 - 6x - 2$ SF

1. expand the $()^2$ term

2. FOIL

3. combine like terms

4. distribute the 3

5. combine like terms

$(x-4)^2 = x^2 - 8x + 16$
 $(x-4)^2 \neq x^2 - 16$

↑
common error