standard form (vertex form)

$y = a(x-p)^2 + q$

general form

$y = ax^2 + bx + c$

"a" same for both forms

$y = -(x-2)^2 + 7$ — same graph — $y = -x^2 + 4x + 3$

changing general to standard form (COMPLETING THE SQUARE ch3)

ex.1 $y = x^2 - 10x + 3$

$a = 1$

$\left(\frac{-10}{2}\right)^2 =$

$y = (x^2 - 10x + 25) - 25 + 3$

TRI SQ FACTOR

$\boxed{y = (x-5)^2 - 22}$

ex.2 $y = \frac{3x^2}{3} - \frac{12x}{3} + 7$

$a = 3$

$\left(\frac{-4}{2}\right)^2$

$y = 3(x^2 - 4x + 4 - 4) + 7$

$y = 3(x-2)^2 - 12 + 7$

$y = 3(x-2)^2 - 12 + 1$

$$\boxed{y = 3(x-2)^2 - 5}$$

changing standard to general form

ex. 3 $y = \frac{1}{5}(x+5)^2 - 4$

$a = \frac{1}{5}$

$y = ax^2 + bx + c$

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

$y = \frac{1}{5}(x^2 + 5x + 5x + 25) - 4$

$y = \frac{1}{5}(x^2 + 10x + 25) - 4$

$y = \frac{1}{5}x^2 + 2x + 5 - 4$

$$\boxed{y = \frac{1}{5}x^2 + 2x + 1}$$

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