2.2 Standard Form of a Quadratic Function $\qquad y = ax^2 + bx + c$

his x-coordinate of vertex

What is the x - coordinate of the vertex of $\qquad y = ax^2 + bx + c$

$y = a(x - h)^2 + k$

$= a(x-h)(x-h) + k$

$= a(x^2 - xh - xh + h^2) + k$

$= a(x^2 - 2xh + h^2) + k$

$= ax^2 - 2axh + ah^2 + k$

Find the x-coordinate of vertex in standard form

$x = -\dfrac{b}{2a}$

$y = ax^2 \underbrace{(-2axh)} + ah^2 + k$

$y = ax^2 + bx + c$

$\dfrac{b\cancel{x}}{\cancel{x}} = -\dfrac{2a\cancel{x}h}{\cancel{x}}$

$\dfrac{b}{-2a} = \dfrac{-\cancel{2}ah}{\cancel{-2}a}$

$h = \dfrac{b}{-2a}$