Download this PDF to your computer and go to
www.livescribe.com/player
On iOS, open the PDF in Livescribe+.

Quadratic Functions: General Form

$f(x) = x^2 + 6x + 7 = a(x-h)^2 + k$

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

$ax^2 + 6x + 7 = ax^2 - 2hax + ah^2 + k$

$= x^2 - 2hx + h^2 + k$

$= x^2 + 6x + 9 + k$

$a = 1$

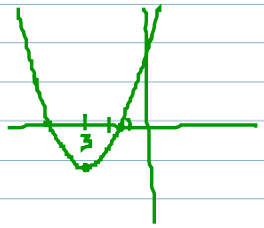
$-2h = 6 \quad \boxed{h = -3}$

$k + 9 = 7 \quad \boxed{k = -2}$

$f(x) = x^2 + 6x + 7 = (x-(-3))^2 - 2 = (x+3)^2 - 2$

Vertex $(-3, -2)$

x-intercepts $f(x) = 0$ $\quad (x+3)^2 - 2 = 0$



$(x+3)^2 = 2$

$x + 3 = \pm\sqrt{2}$

$x = -3 + \sqrt{2}, -3 - \sqrt{2}$

$x^2 + 6x + 7 = x^2 + 6x + 9 - 9 + 7$

$= (x+3)^2 - 2$

"Completing the square"

Vertex of $y = ax^2 + bx + c$ is always at $x = -\frac{b}{2a}$

09.26.2013 11:07:16 AM 9/26/13, 4:07 AM, 17m 48s

livescribe

Quadratic Functions: General Form

$f(x) = x^2 + 6x + 7 = a(x-h)^2 + k$

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

$1x^2 + 6x + 7 = ax^2 - 2hax + ah^2 + k$

$a = 1$

$= x^2 - 2hx + h^2 + k$

$-2h = 6 \quad \boxed{h = -3}$

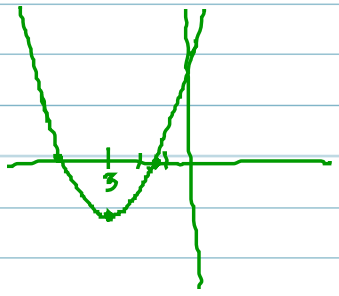
$= x^2 + 6x + 9 + k$

$k + 9 = 7 \quad \boxed{k = -2}$

$f(x) = x^2 + 6x + 7 = (x - (-3))^2 - 2 = (x+3)^2 - 2$

Vertex $(-3, -2)$

x-intercepts: $f(x) = 0 \qquad (x+3)^2 - 2 = 0$



$(x+3)^2 = 2$

$x + 3 = \pm\sqrt{2}$

$x = -3 + \sqrt{2}, \; -3 - \sqrt{2}$

$x^2 + 6x + 7 = x^2 + 6x + 9 - 9 + 7$

$= (x+3)^2 - 2$

"Completing the square"

Vertex of $y = ax^2 + bx + c$ is always at $x = -\frac{b}{2a}$

$x^2 + 6x + 7 = 1\left(x - (-3)\right)^2 + \cdots$

$a = 1 \quad b = 6 \quad -\frac{b}{2a} = -3$

$= (x+3)^2 + \cdots$

$= \underbrace{(x+3)^2 - 9}_{x^2+6x} + 7 = (x+3)^2 - 2$

$x^2 + 6x + 7 = 0$

The quadratic formula: The solution of

$ax^2 + bx + c = 0$ is $x = \dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$a = 1 \quad b = 6 \quad c = 7$

Solutions of $x^2 + 6x + 7$ are $x = \dfrac{-6 \pm \sqrt{36 - 28}}{2}$

$x = \dfrac{-6 \pm \sqrt{8}}{2}$ vs. $-3 \pm \sqrt{2}$

$\sqrt{8} = \sqrt{4 \cdot 2} = \sqrt{4}\sqrt{2} = 2\sqrt{2}$

$x = \dfrac{-6 \pm 2\sqrt{2}}{2} = -3 \pm \sqrt{2}$

$ax^2 + bx + c = 0$

$x^2 + \frac{b}{a}x + \frac{c}{a} = 0$

$x^2 + \frac{b}{a}x + \frac{c}{a} = \left(x + \frac{b}{2a}\right)^2 + \frac{b^2}{4a^2} + \frac{c}{a}$

$= \left(x + \frac{b}{2a}\right)^2 - \frac{(b^2 - 4ac)}{4a^2}$

Etc.