20.2 The Quadratic Formula

❖ **Solving Quadratic Equations Using the Quadratic Formula**

The <u>quadratic formula</u> is derived by solving the equation $ax^2 + bx + c = 0$ by <u>completing the square</u>.

The Quadratic Formula

The solutions of $ax^2 + bx + c = 0$, $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Ex. Solve $8x^2 - 2x = 7$ using the quadratic formula.

Ex. Solve $m^2 - 6(m-2) = -1$ using the quadratic formula.

Ex. Solve $1 + \dfrac{8}{x} = \dfrac{20}{x^2}$ using the quadratic formula.

Ex. Find the *x*-intercepts of each function.

(a) $f(x) = 8x^2 - 2x - 7$

(b) $f(m) = m^2 - 6m + 13$

(c) $f(x) = x^2 + 8x - 20$