

## 4.7 QUADRATIC FORMULA

THE SOLUTIONS OF  $ax^2 + bx + c = 0$

ARE

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

EX: SOLVE BY THE QUADRATIC FORMULA

$$8x^2 - 2x - 3 = 0$$

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(8)(-3)}}{2(8)}$$

$$= \frac{2 \pm \sqrt{4 + 96}}{16} = \frac{2 \pm \sqrt{100}}{16}$$

$$= \frac{2 \pm 10}{16}$$

$$x = \frac{12}{16}, \frac{-8}{16}$$

$$x = \frac{3}{4}, -\frac{1}{2}$$

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

$b^2 - 4ac$  IS CALLED THE DISCRIMINANT

IF  $b^2 - 4ac < 0$ , TWO COMPLEX SOLUTIONS

IF  $b^2 - 4ac = 0$ , ONE REAL SOLUTION

IF  $b^2 - 4ac > 0$ , TWO REAL SOLUTIONS

EX: SOLVE  $3x^2 - x + 2 = 0$

$$x = \frac{-(-1) \pm \sqrt{(-1)^2 - 4(3)(2)}}{2(3)}$$

$$x = \frac{1 \pm \sqrt{1 - 24}}{6} = \frac{1 \pm \sqrt{-23}}{6}$$

$$x = \frac{1 \pm i\sqrt{23}}{6}$$