Quadratic Formula

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

Know it!

No calculator,please.

Solve. Express in simplified radical form

Example 1 $2x^2 - 4x - 9 = 0$

$a=2 \quad b=-4 \quad c=-9$

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(2)(-9)}}{2(2)}$$

$$x = \frac{4 \pm \sqrt{16+72}}{4}$$

$$x = \frac{4 \pm \sqrt{88}}{4} = \frac{4 \pm \sqrt{4}\cdot\sqrt{22}}{4} = \frac{4 \pm 2\sqrt{22}}{4}$$

$$= \frac{2(2 \pm \sqrt{22})}{4_2}$$

$$= \frac{2 \pm \sqrt{22}}{2}$$

Example 2 $3x^2 - x = 4$

must have 0

$$3x^2 - x - 4 = 0$$

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

$$x = \frac{1 \pm \sqrt{1+48}}{6} = x = \frac{1 \pm \sqrt{49}}{6} = \frac{1 \pm 7}{6}$$

$$\frac{1+7}{6}, \frac{1-7}{6}$$

$$\frac{8}{6} = \frac{4}{3}, \frac{-6}{6} = -1$$

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