ZERO FACTOR PROPERTY

IF

$PQ = 0$

THEN

$P = 0 \quad Q = 0$

1. $x^2 - 7x - 30 = 0$ (PSD)

$(x-10)(x+3) = 0$

$x - 10 = 0 \quad x + 3 = 0$

$x = 10 \quad x = -3$

2. $9x^2 - 28x = -3$

$9x^2 - 28x + 3 = 0$ (KEY #)

$(9x-1)(x-3) = 0$

$9x - 1 = 0 \quad x - 3 = 0$

$9x = 1 \quad x = 3$

$\frac{9x}{9} = \frac{1}{9}$

$x = \frac{1}{9}$

3. $27x - 5 = (3x+1)^2$

$27x - 5 = (3x+1)(3x+1)$

$27x - 5 = 9x^2 + 3x + 3x + 1$

$27x - 5 = 9x^2 + 6x + 1$

$0 = 9x^2 + 6x - 27x + 1 + 5$

$0 = 9x^2 - 21x + 6$

$0 = 3(3x^2 - 7x + 2)$ GCF, KEY #

$Q = 3(3x-1)(x-2)$

$3 = 0 \quad 3x - 1 = 0 \quad x - 2 = 0$

$3x = 1 \quad x = 2$

$\frac{3x}{3} = \frac{1}{3}$

$x = \frac{1}{3}$

SQUARE ROOT PROPERTY

IF

$P^2 = Q$

THEN

$P = \pm\sqrt{Q}$

4. $5x^2 - 1 = 44$

$5x^2 = 44 + 1$

$5x^2 = 45$

$\frac{5x^2}{5} = \frac{45}{5}$

$x^2 = 9$

$x = \pm\sqrt{9}$

$x = \pm\sqrt{3 \cdot 3}$

$x = \pm 3$

$x = -3 \quad x = 3$

5. $(x-5)^2 = -16$

$x - 5 = \pm\sqrt{-16}$

$x - 5 = \pm\sqrt{-1 \cdot 4 \cdot 4}$

$x - 5 = \pm 4i$

$x = 5 \pm 4i$