Solving Quadratic Equations using Square Roots:

- Only when b=0
- Get x^2 or $(\ )^2$ by itself on one side of the = sign
- Take the square root of both sides

Solve each using square roots:

1. $6x^2 + 7 = 31$

$\frac{6x^2}{6} = \frac{24}{6}$

$x^2 = 4$

$x = \pm 2$

2. $7x^2 - 8 = 27$

$+8 \quad +8$

$\frac{7x^2}{7} = \frac{35}{7}$

$\sqrt{x^2} = \sqrt{5}$

$x = \pm\sqrt{5}$

3. $3x^2 + 38 = 11$

$-38 \quad -38$

$\frac{3x^2}{3} = \frac{-27}{3}$

$x^2 = -9$

Hassan

$\sqrt{-9}$ No Real Numbers

4. $5x^2 + 7 = 2x^2 + 23$

$-2x^2 \quad -2x^2$

$\frac{3x^2}{3} = \frac{16}{3}$

$\sqrt{x^2} = \sqrt{\frac{16}{3}} = \pm\frac{4}{\sqrt{3}} = \pm\frac{4\sqrt{3}}{3}$

Solve each using square roots.

5. $9x^2 - 8 = 41$

$+8 \quad +8$

$\frac{9x^2}{9} = \frac{49}{9}$

$x = \pm\frac{7}{3}$

6. $(x + 3)^2 - 5 = 31$

$+5 \quad +5$

$\sqrt{(x+3)^2} = \sqrt{36}$

$x + 3 = \pm 6$

$+6 \quad -3$

$-6 \quad -3$

$x = 3, -9$

7. $(x - 7)^2 + 5 = 16$

$-5 \quad -5$

$\sqrt{(x-7)^2} = \sqrt{11}$

$x - 7 = \pm\sqrt{11}$

$+7 \quad +7$

$x = 7 \pm \sqrt{11}$

Methods to solve Quadratic Equations:

1. Graphing:
   a. Intersections
   b. Zeros (x-intercepts)
2. Factoring: Only if factorable
3. Square Roots: Only if b=0

Solving by graphing:

Method 1: Rewrite equation into Standard Form
$ax^2 + bx + c = 0$
and find the zeros of the function.

Method 2: Graph both sides separately and find the intersections.

Solve this system of quadratic equations:

$y = 4x^2-16x+19$

$y= -3x^2+12x - 9$

1. Graphing

2. Factoring

$4x^2-16x+19 = -3x^2+12x-9$

$7x^2-28x+28 = 0$

$7(x^2-4x+4) = 0$

$7(x-2)^2 = 0$

x = 2

3. Square Roots

Can't use this method because there is a "b" term.

Solve this equation.

$x^2 + x - 5 = 2x + 1$

1. Graphing

2. Factoring

$x^2-x-6 = 0$

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

$x = 3, -2$

3. Square Roots

Can't use this method because there is a "b" term.

Solve this equation.

$9x^2 - 4x + 15 = 7x^2 - 4x + 27$

1. Graphing

2. Factoring

$2x^2-12 = 0$

$2(x^2-6) = 0$

$x^2-6 = 0$

3. Square Roots

$9x^2+15 = 7x^2+27$

$-15 \quad -15$

$9x^2 = 7x^2+12$

$\frac{2x^2}{2} = \frac{12}{2}$

$x^2 = 6$

$x = \pm\sqrt{6}$