Now, ALL quadratic equations have TWO solutions.

Some of these solutions may be imaginary.

Find ALL Exact Complex Solutions (real and imaginary) using Square Roots.

1. $3x^2 + 70 = 22$

2. $96 - 2x^2 = 6$

3. $(x + 5)^2 + 38 = 10$

1. $3x^2 + 70 = 22$

$-70 \quad -70$

$\frac{3x^2}{3} = \frac{-48}{3}$

$\sqrt{x^2} = \sqrt{-16}$

$x = \pm 4i$

2. $96 - 2x^2 = 6$

$-96 \quad -96$

$\frac{-2x^2}{-2} = \frac{-90}{-2}$

$\sqrt{x^2} = \sqrt{45}$

$x = \pm 3\sqrt{5}$

3. $(x + 5)^2 + 38 = 10$

$-38 \quad -38$

$\sqrt{(x+5)^2} = \sqrt{-28}$

$x + 5 = \pm 2i\sqrt{7}$

$-5 \quad -5$

$x = -5 \pm 2i\sqrt{7}$

Find ALL Exact Complex solutions using the Quadratic Formula.

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

1. $x^2 - 6x + 25 = 0$
2. $2x^2 - 10x + 17 = 0$
3. $x^2 - 3x + 23 = 0$

Find ALL Complex solutions using the Quadratic Formula.

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

$x^2 - 6x + 25 = 0$

$b^2 - 4ac = -64$

$\frac{6 \pm \sqrt{-64}}{2} = \frac{6 \pm 8i}{2} = 3 \pm 4i$

Find ALL solutions

$2x^2 - 10x + 17 = 0$

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

$b^2 - 4ac = -36$

$\frac{10 \pm \sqrt{-36}}{4} = \frac{10 \pm 6i}{4} = \frac{5 \pm 3i}{2}$

Find ALL solutions

$x^2 - 3x + 23 = 0$

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

$b^2 - 4ac = -83$

$\frac{3 \pm \sqrt{-83}}{2} = \frac{3 \pm i\sqrt{83}}{2}$

Find ALL Exact Complex solutions by completing the square.

1. $x^2 - 4x + 20 = 0$

2. $x^2 + 6x + 33 = 0$

1. $x^2 - 4x + 20 = 0$

$x^2 - 4x \underline{+4} = -20 + 4$

$\sqrt{(x-2)^2} = \sqrt{-16}$

$x - 2 = \pm 4i$

$+2 \quad +2$

$x = 2 \pm 4i$

2. $x^2 + 6x + 33 = 0$

$x^2 + 6x \underline{+9} = -33 + 9$

$\sqrt{(x+3)^2} = \sqrt{-24}$

$x + 3 = \pm 2i\sqrt{6}$

$-3 \quad -3$

$x = -3 \pm 2i\sqrt{6}$

Find ALL Exact Complex solutions by factoring.

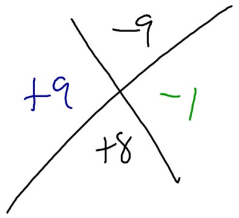
$$x^4 + 8x^2 - 9 = 0$$

$(x^2+9)(x^2-1) = 0$

$(x^2+9)(x\pm 1) = 0$

$x^2+9=0 \rightarrow \sqrt{x^2} = \sqrt{-9}$

$x = \pm 1, \pm 3i$



You can now finish Hwk 23

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