QUIZ #4 @ 20 points - Section 8.1

1) Solve each equation by the square root property.

a) $16x^2 = 25$

$x^2 = \frac{25}{16}$

$\sqrt{x^2} = \sqrt{\frac{25}{16}}$

$|x| = \frac{5}{4}$

$x = \pm\frac{5}{4}$

b) $(x-5)^2 + 9 = 0$

$(x-5)^2 = -9$

$\sqrt{(x-5)^2} = \sqrt{-9}$

$x - 5 = \pm 3i$

$x = 5 \pm 3i$

2) Solve each equation by completing the square.

a) $x^2 + 2x + 2 = 0$

$x^2 + 2x = -2$

$\left(\frac{1}{2}\cdot 2\right)^2 = 1$

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

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

$\sqrt{(x+1)^2} = \sqrt{-1}$

$x + 1 = \pm i$

$x = -1 \pm i$

b) $2x^2 + 3x - 5 = 0$

$2x^2 + 3x = 5$

$x^2 + \frac{3}{2}x = \frac{5}{2}$

$\left(\frac{1}{2}\cdot\frac{3}{2}\right)^2 = \left(\frac{3}{4}\right)^2 = \frac{9}{16}$

$x^2 + \frac{3}{2}x + \frac{9}{16} = {}^{8/}\frac{5}{2} + \frac{9}{16}$

$\left(x + \frac{3}{4}\right)^2 = \frac{49}{16}$

$\sqrt{\left(x + \frac{3}{4}\right)^2} = \sqrt{\frac{49}{16}}$

$\left|x + \frac{3}{4}\right| = \frac{7}{4}$

$x + \frac{3}{4} \pm \frac{7}{4}$, so $x = -\frac{3}{4} \pm \frac{7}{4}$

$x_1 = -\frac{3}{4} + \frac{7}{4} = 1$ and $x_2 = -\frac{3}{4} - \frac{7}{5} = -\frac{5}{2}$

3) Solve each equation by the quadratic formula.

a) $6x^2 = 2x+1$

$6x^2 - 2x - 1 = 0$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x_{1,2} = \frac{2 \pm \sqrt{4 - 4(6)(-1)}}{2(6)}$$

$$x_{1,2} = \frac{2 \pm \sqrt{28}}{12} = \frac{2 \pm 2\sqrt{7}}{12}$$

$$x_{1,2} = \frac{1 \pm \sqrt{7}}{6}$$

b) $x^2 - 4x + 8 = 0$

$$x_{1,2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x_{1,2} = \frac{4 \pm \sqrt{16 - 4(1)(8)}}{2(1)}$$

$$x_{1,2} = \frac{4 \pm \sqrt{16 - 4(1)(8)}}{2(1)}$$

$$x_{1,2} = \frac{4 \pm \sqrt{-16}}{2} = \frac{4 \pm 4i}{2}$$

$$x_{1,2} = 2 \pm 2i$$