Algebra I TUES. 4-23-13 Class Notes

(8) $x^2 + 2x = 21$

$x^2 + 2x + \{1^2\} = 21 + \{1\}$

$(x + 1)^2 = 22$

$x + 1 = \pm\sqrt{22}$

22 → (2)(11)

$x = -1 \pm \sqrt{22}$

$x = \{-1+\sqrt{22}, -1-\sqrt{22}\}$

CK $(-1+\sqrt{22})^2 + 2(-1+\sqrt{22}) \stackrel{?}{=} 21$

$(-1+\sqrt{22})(-1+\sqrt{22}) - 2 + 2\sqrt{22} \stackrel{?}{=} 21$

$1 - 1\sqrt{22} - 1\sqrt{22} + 22 - 2 + 2\sqrt{22} \stackrel{?}{=} 21$

$23 - 2\sqrt{22} - 2 + 2\sqrt{22} \stackrel{?}{=} 21$ ✓

(7) $x^2 + x = 30$

$x^2 + x + \left\{\left(\frac{1}{2}\right)^2\right\} = 30 + \left\{\frac{1}{4}\right\}$

$\left(x + \frac{1}{2}\right)^2 = \frac{121}{4}$

$x + \frac{1}{2} = \pm \frac{11}{2}$

$x = -\frac{1}{2} \pm \frac{11}{2}$

$\boxed{x = \{5, -6\}}$

✓ ✓

⑥ $x^2 - 8x = 9$

$1x^2 - 8x + \{4^2\} = 9 + \{16\}$

$(x-4)^2 = 25$

$x - 4 = \pm 5$

$x = 4 \pm 5$

$x = \{9, -1\}$

(5) $x^2 + 6x = -5$

$x^2 + 6x + \{3^2\} = -5 + \{9\}$

$\sqrt{(x+3)^2} = \pm\sqrt{4}$

$x + 3 = \pm 2$

$x = -3 \pm 2$

$x = \{-1, -5\}$

(2) $-23 = -8x^2 - 16x$

$\frac{8x^2}{8} + \frac{16x}{8} = \frac{23}{8}$

$x^2 + 2x + \{1^2\} = \frac{23}{8} + \{\frac{8}{8}\}$

$(x+1)^2 = \frac{31}{8}$

$x+1 = \pm\sqrt{\frac{31}{8}}$

$x = -1 \pm \frac{\sqrt{31}}{2\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$\{62 \quad (2)(31)$

$\boxed{x = -1 \pm \frac{\sqrt{62}}{4}}$

$x = \frac{-4}{4} \pm \frac{\sqrt{62}}{4} = \left\{\frac{-4+\sqrt{62}}{4}, \frac{-4-\sqrt{62}}{4}\right\}$

(see next pg for CK) →

$$\underline{CK} \quad \{-23 \stackrel{?}{=}\} -8\left[\frac{-4+\sqrt{62}}{4}\right]^2 - 16\left[\frac{-4+\sqrt{62}}{4}\right]$$

$$-8\left[\frac{-4+\sqrt{62}}{4}\right]\left[\frac{-4+\sqrt{62}}{4}\right] + 16 - 4\sqrt{62}$$

$$-8\left[\frac{16 - 8\sqrt{62} + 62}{16}\right] + 16 - 4\sqrt{62}$$

$$\frac{78}{2}$$

$$-8 + 4\sqrt{62} - 31 + 16 - 4\sqrt{62}$$

$$-39 + 16$$

$$-23 \checkmark$$