

HW: 9.4/11-29 odd (don't round, use radicals)

Warm up:

Factor.

1) $x^2 + 8x + 16$ $(x + 4)^2$

2) $x^2 - 10x + 25$ $(x - 5)^2$

3) $x^2 + 14x + 49$ $(x + 7)^2$

$$(x + 6)^2 = 100 \quad \sqrt{(x + 6)^2} = \sqrt{100}$$

$$(x+6)(x+6) = 100$$

$$x^2 + 12x + 36 = 100$$

$$\begin{array}{r} -100 \quad -100 \\ \hline \end{array}$$

$$x^2 + 12x - 64 = 0$$

$$(x+16)(x-4) = 0$$

$$x = -16, 4$$

$$x + 6 = \pm 10$$

$$\begin{array}{r} -6 \quad -6 \\ \hline \end{array}$$

$$x = -6 \pm 10$$

$$x = 4, -16$$

$$\sqrt{\left(y - \frac{3}{7}\right)^2} = \sqrt{\frac{8}{9}}$$

$$y - \frac{3}{7} = \pm \sqrt{\frac{8}{9}}$$

$$y = \frac{3}{7} \pm \sqrt{\frac{8}{9}}$$

$$\frac{3}{7} \pm \frac{\sqrt{8}}{3}$$

$$\frac{3}{7} \pm \frac{2\sqrt{2}}{3}$$

$$\frac{9}{21} \pm \frac{14\sqrt{2}}{21}$$

$$y = \frac{9 \pm 14\sqrt{2}}{21}$$

$$\frac{9 + 14\sqrt{2}}{21}$$

$$\frac{9 - 14\sqrt{2}}{21}$$

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

$$\sqrt{6} = 3 \quad 3^2 = 9$$

$$x^2 + 10x + \underline{25}$$

$$\sqrt{10} = 5 \quad 5^2$$

Perfect Square Trinomial

$$x^2 + bx + (b/2)^2$$

$$x^2 + 8x + 2 = 0$$

$$x^2 + 8x = -2$$

$$x^2 + 8x + 16 = 14$$

$$\sqrt{(x+4)^2} = \sqrt{14}$$

$$x + 4 = \pm \sqrt{14}$$

$$x = -4 \pm \sqrt{14}$$

$$x^2 - 12x + 4 = 0$$

$$\begin{array}{r} x^2 - 12x = -4 \\ + 36 + 36 \end{array}$$

$$\begin{array}{r} x^2 - 12x + 36 = 32 \\ \sqrt{(x-6)^2} = \sqrt{32} \end{array}$$

$$\begin{array}{r} x - 6 = \pm \sqrt{32} \\ +6 +6 \end{array}$$

$$x = 6 \pm \sqrt{32}$$

$$x = 6 \pm 4\sqrt{2}$$

$$\left(\frac{9}{2}\right)^2$$

$$\left(\frac{5}{2}\right)^2$$

$$\frac{81}{4}$$

$$\frac{25}{4}$$

$$\frac{2x^2 - 10x - 18 = 0}{2}$$

$$x^2 - 5x - 9 = 0$$

$$x^2 - 5x = 9 - 9 = \frac{36}{4}$$

$$x^2 - 5x + \frac{25}{4} = \frac{61}{4}$$

$$\sqrt{\left(x - \frac{5}{2}\right)^2} = \sqrt{\frac{61}{4}}$$

$$x - \frac{5}{2} = \pm \frac{\sqrt{61}}{2}$$

$$x = \frac{5}{2} \pm \frac{\sqrt{61}}{2}$$

$$x = \frac{5 \pm \sqrt{61}}{2}$$

$$5x^2 + 8x + 1 = 0$$

$\frac{8}{5} \div 2$
 $\left(\frac{4}{5}\right)^2$
 $\frac{16}{25}$

$$\underline{\hspace{10em}}$$

$$x^2 + \frac{8}{5}x + \frac{1}{5} = 0$$

$$x^2 + \frac{8}{5}x - \frac{1}{5} = -\frac{1}{5}$$

$$x^2 + \frac{8}{5}x + \frac{16}{25} = \frac{11}{25}$$

$$\sqrt{\left(x + \frac{4}{5}\right)^2} = \sqrt{\frac{11}{25}}$$

$$x + \frac{4}{5} = \pm \sqrt{\frac{11}{25}}$$

$$x = -\frac{4}{5} \pm \frac{\sqrt{11}}{5}$$

$$x = \frac{-4 \pm \sqrt{11}}{5}$$

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

$$x = \pm 5$$

Solve by completing the square.

1) $x^2 - 3x - 18 = 0$

5) $\frac{3m^2}{4} - 3 = \frac{m}{2}$

2) $x^2 - 4x = 17$

3) $v^2 - 20v + 19 = 0$

6) $x + 1 = \frac{2 + x}{4x}$

4) $5a^2 - 20a = 10$

$$1) x^2 - 3x - 18 = 0$$

$$\begin{array}{r} x^2 - 3x = 18 \\ + 9 \quad + 9 \\ \hline x^2 - 3x + 9 = \frac{27}{4} \end{array}$$

$$\begin{array}{r} x^2 - 3x + 9 \\ \hline x^2 - 3x + 9 = \frac{27}{4} \end{array}$$

$$\sqrt{(x - \frac{3}{2})^2} = \sqrt{\frac{27}{4}}$$

$$\begin{array}{l} x - \frac{3}{2} = \pm \sqrt{\frac{27}{4}} \\ x = \frac{3}{2} \pm \frac{3\sqrt{3}}{2} \\ x = \frac{3 \pm 3\sqrt{3}}{2} \end{array}$$

$$= \frac{3(1 \pm \sqrt{3})}{2}$$

$$2) x^2 - 4x = 17$$

$$\begin{array}{r} + 4 + 4 \\ \hline x^2 - 4x + 4 = 21 \\ \hline \sqrt{(x-2)^2} = \sqrt{21} \end{array}$$

$$\begin{array}{r} x - 2 = \pm \sqrt{21} \\ + 2 \quad + 2 \end{array}$$

$$\boxed{x = 2 \pm \sqrt{21}}$$

$$3) v^2 - 20v + 19 = 0$$

$$\quad -19 \quad -19$$

$$v^2 - 20v = -19$$

$$\quad +100 \quad +100$$

$$v^2 - 20v + 100 = 81$$

$$\sqrt{(v-10)^2} = \sqrt{81}$$

$$v - 10 = \pm 9$$

$$\quad +10 \quad +10$$

$$v = 10 \pm 9 = \underline{19} \quad |$$

$$4) \frac{5a^2 - 20a}{5} = \frac{10}{5}$$

$$\frac{a^2 - 4a}{+4 \quad +4} = 2$$

$$a^2 - 4a + 4 = 6$$

$$\sqrt{(a-2)^2} = \sqrt{6}$$

$$\frac{a-2}{+2} = \pm \frac{\sqrt{6}}{+2}$$

$$a = 2 \pm \sqrt{6}$$

$$5) \left(\frac{3m^2}{4} - 3 \right) \left(\frac{m}{2} \right) 4$$

$$3m^2 - 12 = 2m$$

$$-2m + 12 \quad + 12 \quad - 2m$$

$$\frac{3m^2 - 2m = 12}{3}$$

$$m^2 - \frac{2}{3}m = 4$$

$$m^2 - \frac{2}{3}m + \frac{1}{9} = 4 + \frac{1}{9}$$

$$\sqrt{\left(m - \frac{1}{3}\right)^2} = \sqrt{\frac{37}{9}}$$

$$m - \frac{1}{3} = \pm \sqrt{\frac{37}{9}}$$

$$m = \frac{1}{3} \pm \frac{\sqrt{37}}{3} = \frac{1 \pm \sqrt{37}}{3}$$

$$6) \quad x + 1 = \frac{2 + x}{4x}$$

