Completing the Square 55 & 56

Solving a Quadratic Equation by *Completing the Square*

0. Check to see if the left side is a PST already. If so, skip to step 4.
1. Write equation in the form $ax^2 + bx = c$
2. Divide all terms by **a.**
3. Divide the new coefficient of x by 2 then square it.
   Add this number to both sides of the equation.
4. Write the left-hand side as a PST. Simplify the right-hand side.
5. Take square roots of both sides.
6. Isolate the x.

$$x^2 + 20x + 100 = 81$$

$$\sqrt{(x+10)^2} = \sqrt{81}$$

$$x + 10 = \pm 9$$

$$-10 \quad -10$$

$$x = -10 \pm 9$$

$-10+9=-1$

$-10-9=-19$

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$$x^2 - 10x + 1 = 0$$

$$-1 \qquad -1$$

$$x^2 - 10x = -1$$

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$\frac{10}{2} = 5$

$5^2 = 25$

$$x^2 - 10x + 25 = -1 + 25$$

$$\sqrt{(x-5)^2} = \sqrt{24}$$

$$x - 5 = \pm\sqrt{24}$$

$$+5 \qquad +5$$

$$x = 5 \pm \sqrt{24}$$

$$x = 5 \pm \sqrt{4}\sqrt{6}$$

$$x = 5 \pm 2\sqrt{6}$$

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$$3x^2 - 36x + 150 = 0$$
$$-150 \quad -150$$

$$\frac{3x^2}{3} - \frac{36x}{3} = \frac{-150}{3}$$

$$x^2 - 12x = -50$$

$$x^2 - 12x + 36 = -50 + 36$$

$$\sqrt{(x-6)^2} = \sqrt{-14}$$

$$x - 6 = \pm\sqrt{-14}$$

$$x - 6 = \pm i\sqrt{14}$$
$$+6 \quad +6$$

$$x = 6 \pm i\sqrt{14}$$

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$8p^2 - 16p - 10 = 0$

$\frac{8p^2}{8} - \frac{16p}{8} = \frac{10}{8}$

$p^2 - 2p = \frac{5}{4}$

$\frac{2}{2} = 1$

$1^2 = 1$

$p^2 - 2p + 1 = \frac{5}{4} + 1$

$\frac{5}{4} + \frac{4}{4} = \frac{9}{4}$

$\sqrt{(p-1)^2} = \sqrt{\frac{9}{4}}$

$p - 1 = \pm\frac{3}{2}$

$+1 \quad +1$

$p = 1 \pm \frac{3}{2}$

$1 + \frac{3}{2} = \frac{5}{2}$

$1 - \frac{3}{2} = -\frac{1}{2}$

p. 279/ # 3 - 17, 22 - 33, 53 - 56 due Thursday, Dec 5

p.54

12/2/13: Completing the Square Lab In-class assignment: Tuesday, Dec 3

12/3/13: Completing the square worksheet due Friday

12/5/13: p. 288/ # 35 - 40, 43 - 47, 50, 51, 55 - 57, 62 - 67, 69, 71, 73

due Monday