Warm-Up:

1) Write the equation of the line in slope-intercept form that passes through the points (1, 3) and (-5, 9).

Factor by grouping:

3)
$$3x^3 - 12x^2 + 5x - 20$$

 $3x^2 (x-4) + 5(x-4)$
 $(3x^2+5)(x-4)$

4) $16ab - 20a^{3} + 4b - 5a^{2}$ $40(4b-5a^{2}) + 1(4b-5a^{2})$ $(4b-5a^{2})(4a+1)$

In a <u>perfect square trinomial</u>, there is a relationship between the coefficient of the x-term (b) and the constant term (c).

$$ax^{2} + bx + C$$

 $x^{2} + 8x + 16$ $x^{2} - 12x + 36$

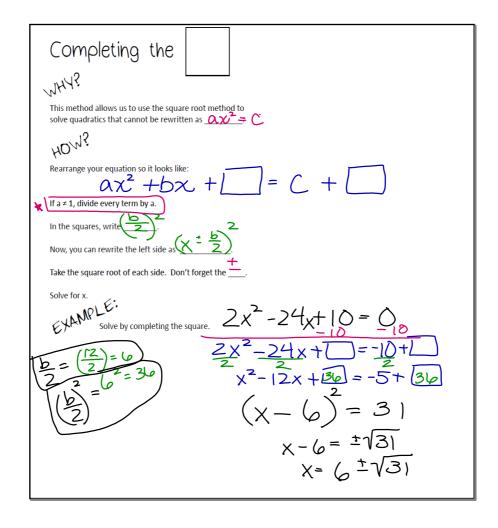
If we divide each x-term by two, then square the result we get the constant term.

Completing the Square: is the process of writing a quadratic equation so that one side is a perfect square trinomial.

1) Complete the square to form a perfect-square trinomial.

a.
$$x^2 + 2x + 1$$
 $\frac{2}{2} = 1$ $|^2 = 1$

c.
$$x^2 + 5x + \frac{25}{4}$$
 $\frac{5}{2}$ $(\frac{5}{2})^2 = \frac{25}{4}$



3) Solve by completing the square: $x^2 - 4x - 45 = 0$

Step 1:
$$ax^2 + bx = c$$
 $\chi^2 - 4\chi + \Box = 45 + \Box$

Step 2:
$$b/2$$
 $\frac{4}{2} = 2$

Step 3:
$$(b/2)^2$$
 $(\frac{4}{2})^2 = 4$

Step 4: add
$$(b/2)^2$$
 $\chi^2 - 4\chi + 4 = 45 + 4$
Step 5: factor $(\chi - 2)^2 = \sqrt{49}$
Step 6: Solve $\chi - 2 = \pm 7$
 $\chi = 2 \pm 7$

Step 5: factor
$$\sqrt{2}-\sqrt{4}$$

Step 6: Solve
$$\chi - 2 = \pm 49$$

$$\chi - 2 = \pm 7$$

2) Solve by completing the square: $x^2 + 8x = 1$

Step 1:
$$ax^2 + bx = c$$

Step 2:
$$b/2 = 4$$

Step 3:
$$(b/2)^2$$
 $(4)^2 = 16$

Step 4: add
$$(b/2)^2$$
 $\times^2 + 8 \times + 16 = 1 + 16$

Step 4: add
$$(b/2)^2$$
 $\chi^2 + 8\chi + 16 = 1 + 16$
Step 5: factor $\chi + 4 = \pm \sqrt{17}$

Step 6: Solve
$$\chi = -4 \pm \sqrt{17}$$

Find my mistake:

Solve by completing the square: $x^2 + 4x = 12$

$$b=4 \qquad x^{2}+4x=12 \qquad (x+2)^{2}=16$$

$$4/2=2, 2^{2}=4 \qquad x^{2}+4x+4=12+4 \qquad x^{2}+4x+4=16$$

$$(x+2)(x+2)=16 \qquad \sqrt{x^{2}+4x}=16$$

$$(x+2)^{2}=16 \qquad x=\pm\sqrt{14}$$

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