

Complete the square

Example ①

$$x^2 + 14x - 38 = 0$$

$$x^2 + 14x = 38$$

$$x^2 + 14x + \underline{\hspace{2cm}} = 38 + \underline{\hspace{2cm}}$$

$$x^2 + 14x + \left(\frac{14}{2}\right)^2 = 38 + \left(\frac{14}{2}\right)^2$$

$$(x+7)^2 = 38 + 49$$

$$(x+7)^2 = 87$$

$$x+7 = \pm \sqrt{87}$$

$$x = -7 \pm \sqrt{87}$$

$$\boxed{x = -7 \pm \sqrt{87}}$$

} cannot simplify

Steps

① move -38 to right side

② add a blank on both sides

③ Fill in Blank with

$$\left(\frac{14}{2}\right)^2$$

④ Left side Factors to

$$\left(x + \left(\frac{14}{2}\right)\right)^2$$

simplify right side

⑤ Solve for x by taking $\pm\sqrt{\hspace{1cm}}$ and subtracting

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⑥ Simplify radical

$$13) v^2 - 6v = -91$$

Solving Quadratic Equations By Completing the Square Date _____ Period _____

Solve each equation by completing the square.

$$1) p^2 + 14p - 38 = 0$$

$$2) v^2 + 6v - 59 = 0$$

$$3) a^2 + 14a - 51 = 0$$

$$4) x^2 - 12x + 11 = 0$$

$$5) x^2 + 6x + 8 = 0$$

$$6) n^2 - 2n - 3 = 0$$

$$7) x^2 + 14x - 15 = 0$$

$$8) k^2 - 12k + 23 = 0$$

$$9) r^2 - 4r - 91 = 7$$

$$10) x^2 - 10x + 26 = 8$$

$$11) k^2 - 4k + 1 = -5$$

$$12) b^2 + 2b = -20$$

$$13) v^2 - 6v = -91$$

$$14) n^2 = 18n + 40$$

$$15) 5k^2 = 60 - 20k$$

$$16) 6x^2 - 48 = -12x$$

$$17) 8x^2 + 16x = 42$$

$$18) 9n^2 + 79 = -18n$$

$$19) 2a^2 = -6 + 8a$$

$$20) 2x^2 - 5x + 67 = 0$$

$$21) 4n^2 + 4n + 36 = 0$$

$$22) 7k^2 - 16k + 100 = 0$$

$$23) 10p^2 + 4p + 77 = 9$$

$$24) 3x^2 = -4 + 8x$$