LESSON 9-8 **Practice C** HW

Completing the Square

Complete the square to form a perfect square trinomial.

1. $x^2 + 50x$ $\left(\dfrac{50}{2}\right)^2$

$\underline{x^2 + 50x + 625}$

2. $x^2 + 34x$ $\left(\dfrac{34}{2}\right)^2$

$\underline{x^2 + 34x + 289}$

3. $x^2 + 80x$ $\left(\dfrac{80}{2}\right)^2$

$\underline{x^2 + 80x + 1600}$

Solve each equation by completing the square.

$\left(\dfrac{2}{2}\right)^2$

4. $x^2 - 2x = 80$
$x^2 - 2x + 1 = 81$
$(x-1)^2 = 81$
$x - 1 = \pm 9$
$\underline{10 \text{ and } -8}$

5. $x^2 - 7x = 18$
$\left(\dfrac{7}{2}\right)^2 = \dfrac{49}{4}$
$\underline{back}$

6. $x^2 - 3x = 28$ $\left(\dfrac{3}{2}\right)^2 = \dfrac{9}{4}$
$\underline{back}$

7. $x^2 + 10x + 35 = 0$
$x^2 + 10x + 25 = -35 + 25$
$\underline{n/s}$

8. $x^2 + 8x + 11 = 0$
$\underline{back}$

9. $x^2 + 2x - 6 = 0$
$\underline{back}$

10. $2x^2 + 4x - 70 = 0$
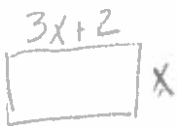$\underline{back}$

11. $2x^2 + 9x + 4 = 0$
$\underline{back}$

12. $3x^2 + 20x + 12 = 0$
$\underline{\dfrac{-2}{3}, \ -6}$

13. A rectangular garden has an area of 432 ft². The length is 2 more than 3 times the width. Find the dimensions of the garden. Solve by completing the square. Round your answer to the nearest tenth of a foot.

$3x+2$ [box] x

$w = 11.7 \quad \ell = 37.1$

$x(3x+2)$
$3x^2 + 2x = 432$
$x^2 + \frac{2}{3}x = 144$

14. The height h in feet of a rocket launched off a roof is given by the equation $h = -16t^2 + 288t + 32$, where t is the time in seconds. After the rocket is launched, how long will it take to return to the ground? Solve by completing the square. Round your answer to the nearest tenth of a second.

$\underline{18.1 \text{ seconds}}$

$x(3x+2)$
$3x^2 + 2x = 432$
$x^2 + \frac{2}{3}x = 144$
$x^2 + \frac{2}{3}x + \frac{1}{9} = \frac{1297}{9}$

$\left(x + \frac{1}{3}\right)^2 = \frac{1297}{9}$
$x + \frac{1}{3} = \pm \sqrt{\frac{1297}{9}}$

$w = 11.7$
$\ell = 37$

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5. $x^2 - 7x = 18$

$x^2 - 7x + \frac{49}{4} = \frac{72}{4} + \frac{49}{4}$

$\left(x + \frac{7}{2}\right)^2 = \frac{121}{4}$

$x - \frac{7}{2} = \pm \frac{11}{2}$

$x - \frac{7}{2} = \frac{11}{2}$ and $x - \frac{7}{2} = \frac{-11}{2} + \frac{7}{2}$

$+ \frac{7}{2}$ ..... $- \frac{7}{2}$

$x = 9$ and -2

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6. $x^2 - 3x = 28$

$x^2 - 3x + \frac{9}{4} = \frac{112}{4} + \frac{9}{4}$

$\left(x - \frac{3}{2}\right)^2 = \frac{121}{4}$

$x - \frac{3}{2} = \pm \frac{11}{2}$

$x - \frac{3}{2} = \frac{11}{2}$ and $x - \frac{3}{2} = \frac{-11}{2}$

$+ \frac{3}{2}$ ..... $+ \frac{3}{2}$

$x = 7$ and -4

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8. $x^2 + 8x + 11 = 0$

$x^2 + 8x + 16 = -11 + 16$

$(x + 4)^2 = 5$

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

$-4 + \sqrt{5}$ and $-4 - \sqrt{5}$

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9. $x^2 + 2x - 6 = 0$

$x^2 + 2x + 1 = 6 + 1$

$(x + 1)^2 = 7$

$x + 1 = \pm \sqrt{7}$

$-1 + \sqrt{7}$ and $-1 - \sqrt{7}$

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10. $\dfrac{2x^2 + 4x - 70 = 0}{2}$

$x^2 + 2x - 35 = 0$

$x^2 + 2x + 1 = 35 + 1$ $\left(\frac{9}{2} \cdot \frac{1}{2}\right)^2$

$(x + 1)^2 = 36$ $\frac{81}{16}$

$x + 1 = \pm 6$

$x = 5$ and -7

$\dfrac{-32}{16} + \dfrac{81}{16}$

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11. $\dfrac{2x^2 + 9x + 4 = 0}{2}$

$x^2 + \frac{9}{2}x + 2 = 0$

$x^2 + \frac{9}{2}x + \frac{81}{16} = -2 + \frac{81}{16}$

$\left(x + \frac{9}{4}\right)^2 = \frac{49}{16}$

$x + \frac{9}{4} = \pm \frac{7}{4}$

$x + \frac{9}{4} = \frac{7}{4}$ and $x + \frac{9}{4} = \frac{-7}{4}$

$- \frac{9}{4}$ ..... $- \frac{7}{4}$

$\frac{-1}{2}$ and -4