

## Quadratic Review

Solve each equation by factoring.

1)  $m^2 = m + 42$

$$m^2 - m - 42 = 0$$

$$(m-7)(m+6) = 0$$

$$m = 7, -6$$

2)  $5n^2 = 11n - 6$

$$5n^2 - 11n + 6 = 0$$

$$5n^2 - 5n - 6n + 6$$

$$5n(n-1) - 6(n-1)$$

$$(5n-6)(n-1) = 0$$

$$n = \frac{6}{5}, 1$$

Solve each equation by completing the square.

3)  $n^2 + 16n - 100 = -3$

$$+100 \quad +100$$

$$n^2 + 16n = 97$$

$$n^2 + 16n + 64 = 97 + 64$$

$$\sqrt{(n+8)^2} = \sqrt{161}$$

$$n+8 = \pm\sqrt{161}$$

$$n = -8 \pm \sqrt{161}$$

4)  $4n^2 + 8n - 18 = -6$

$$+18 \quad +18$$

$$4n^2 + 8n = 12$$

$$4(n^2 + 2n) = 12$$

$$4(n^2 + 2n + 1) = 12 + 4$$

$$4(n+1)^2 = \frac{16}{4}$$

$$\sqrt{(n+1)^2} = \sqrt{4}$$

$$n+1 = \pm 2$$

$$-1 \quad -1$$

$$n = 1, -3$$

Solve each equation with the quadratic formula.

5)  $9x^2 + 1 = 7x$

$$9x^2 - 7x + 1 = 0$$

$$x = \frac{7 \pm \sqrt{(-7)^2 - 4(9)(1)}}{2(9)}$$

$$= \frac{7 \pm \sqrt{13}}{18}$$

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$$\begin{aligned} \textcircled{1} \quad & -16x^2 + 56x + 72 = 0 \\ & -8(2x^2 - 7x - 9) = 0 \\ & -8(2x^2 - 9x + 2x - 9) = 0 \\ & \quad x(2x-9) \quad | \quad (2x-9) \\ & -8(2x-9)(x+1) = 0 \\ & \boxed{x = \frac{9}{2}, -1} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & A = lw \\ & 77 = (2w-3)(w) \\ & 77 = 2w^2 - 3w \quad | \quad 154 \\ & 2w^2 - 3w - 77 = 0 \\ & 2w^2 + 11w - 14w - 77 \\ & w(2w+11) - 7(2w+11) \\ & (2w+11)(w-7) = 0 \\ & \boxed{w = -\frac{11}{2}, 7} \quad \boxed{7 \times 11 \text{ cm}} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & (s+3)(s+2) = 42 \\ & s^2 + 2s + 3s + 6 = 42 \\ & s^2 + 5s - 36 = 0 \\ & s^2 + 9s - 4s - 36 = 0 \\ & s(s+9) - 4(s+9) \\ & (s+9)(s-4) = 0 \\ & \boxed{s = -9, 4} \quad \boxed{4 \text{ ft}} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & (s+7)(s+2) = 126 \\ & s^2 + 12s + 7s + 14 = 126 \\ & s^2 + 19s - 112 = 0 \\ & (s+21)(s-2) = 0 \\ & \boxed{s = -21, 2} \quad \boxed{9 \times 14 \text{ m}} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & (x+4)(x+5) = 90 \\ & x^2 + 5x + 4x + 20 = 90 \\ & x^2 + 9x - 70 = 0 \\ & (x+14)(x-5) = 0 \\ & \boxed{x = -14, 5} \quad \frac{5}{2} = \textcircled{2.5 \text{ yd}} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & 0 = -16t^2 + 8t + 24 \\ & -8(2t - t - 3) = 0 \\ & -8(2t - 3t + 2t - 3) = 0 \\ & \quad t(2t-3) \quad | \quad (2t-3) \\ & -8(2t-3)(t+1) = 0 \\ & \boxed{t = \frac{3}{2}, -1} \quad \textcircled{1.5 \text{ s}} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & 8 = -16t^2 + 34t + 4 \\ & -16t^2 + 34t - 4 = 0 \\ & -2(8t^2 - 17t + 2) = 0 \\ & -2(8t^2 - 16t - 1t + 2) = 0 \\ & \quad 8t(t-2) - 1(t-2) \\ & -2(8t-1)(t-2) = 0 \\ & \boxed{t = \frac{1}{8}, 2} \quad \textcircled{2 \text{ s}} \end{aligned}$$

$$\begin{aligned} \textcircled{8} \quad & 17 = -16t^2 + 52t + 5 \\ & -16t^2 + 52t - 12 = 0 \\ & -4(4t^2 - 13t + 3) = 0 \\ & -4(4t^2 - 12t - 1t + 3) = 0 \\ & \quad 4t(t-3) - 1(t-3) \\ & -4(4t-1)(t-3) = 0 \\ & \boxed{t = \frac{1}{4}, 3} \quad \textcircled{3 \text{ sec}} \end{aligned}$$