

NAME:

DATE:

Key

A2.Q2.BERMELLEEMBO: SOLVING QUADRATIC EQUATIONS BY FACTORING

DAY EQ1
(EQUATIONS)

NOTES

Zero Product Property:

$$a \cdot b = 0$$

one of these MUST be zero

Solve:

$$(x-6)(x+3) = 0$$

$$\begin{array}{r} x-6=0 \\ -6 \quad +6 \\ \hline 6 \end{array}$$

$$\begin{array}{r} x+3=0 \\ -3 \quad -3 \\ \hline -3 \end{array}$$

$$x=6 \text{ OR } x=-3$$

Check:

$$x=6$$

$$(6-6)(6+3)=0$$

$$(0)(9)=0$$

True ✓

$$x=-3$$

$$(-3-6)(-3+3)=0$$

$$(-9)(0)=0$$

True ✓

Solve:

$$(x+4)(2x-1) = 0$$

$$\begin{array}{r} x+4=0 \\ -4 \quad -4 \\ \hline -4 \end{array}$$

$$\begin{array}{r} 2x-1=0 \\ +1 \quad +1 \\ \hline 1 \end{array}$$

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

$$x=-4 \text{ OR } x=\frac{1}{2}$$

Solve:

$$(x+1)(x-5)(x-9) = 0$$

$$\begin{array}{r} x+1=0 \\ -1 \quad -1 \\ \hline -1 \end{array}$$

$$\begin{array}{r} x-5=0 \\ +5 \quad +5 \\ \hline 5 \end{array}$$

$$\begin{array}{r} x-9=0 \\ +9 \quad +9 \\ \hline 9 \end{array}$$

$$x=-1 \text{ OR } x=5 \text{ OR } x=9$$

① Set = to 0

② Factor

③ Solve

Solve each equation by factoring:

① $x^2 - 2x - 15 = 0$ ✓

$(x+3)(x-5) = 0$

$$\begin{array}{r} 15 \\ 1 \cdot 15 \\ \hline +3 -5 \end{array}$$

$$\begin{array}{r} x+3=0 \\ -3 \quad -3 \\ \hline -3 \end{array}$$

$$\begin{array}{r} x-5=0 \\ +5 \quad +5 \\ \hline 5 \end{array}$$

$x = -3$ OR $x = 5$

② $x^2 - 7x = -12$ } set = to zero
 $+12 \quad +12$
 $\quad \quad \quad 0$

$x^2 - 7x + 12 = 0$ ✓

$(x-3)(x-4) = 0$

$$\begin{array}{r} 12 \\ 1 \cdot 12 \\ 2 \cdot 6 \\ \hline -3 \cdot -4 \end{array}$$

$$\begin{array}{r} x-3=0 \\ +3 \quad +3 \\ \hline 3 \end{array}$$

$$\begin{array}{r} x-4=0 \\ +4 \quad +4 \\ \hline 4 \end{array}$$

$x = 3$ OR $x = 4$

③ $x^2 - 24 = 2x$ } set = to zero
 $-2x \quad -2x$
 $\quad \quad \quad 0$

★ Be sure to put $2x$ in the correct spot!

$x^2 - 2x - 24 = 0$ ✓

$(x+4)(x-6) = 0$

$$\begin{array}{r} 24 \\ 1 \cdot 24 \\ 2 \cdot 12 \\ 3 \cdot 8 \\ \hline +4 -6 \end{array}$$

$$\begin{array}{r} x+4=0 \\ -4 \quad -4 \\ \hline -4 \end{array}$$

$$\begin{array}{r} x-6=0 \\ +6 \quad +6 \\ \hline 6 \end{array}$$

$x = 4$ OR $x = 6$

$$Ax^2 + Bx + C = 0$$

① Set = to zero

② Factor

③ Solve

$$\textcircled{4} \quad \frac{2x^2}{2x \cdot x} - 3x - \frac{2}{1 \cdot 2} = 0 \quad \checkmark$$

$$(2x+1)(x-2) = 0$$

$$\begin{array}{rcl} 2x+1 & = & 0 \\ \hline -1 & -1 & \\ & 1 & \end{array} \qquad \begin{array}{rcl} x-2 & = & 0 \\ \hline +2 & +2 & \\ & 2 & \end{array}$$

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

$$x = -\frac{1}{2} \quad \text{OR} \quad x = 2$$

$$\textcircled{5} \quad \begin{array}{rcl} 3x^2 & + & x = 2 \\ -2 & & -2 \\ & & \hline & & 0 \end{array}$$

$$\frac{3x^2}{3x \cdot x} + x - \frac{2}{1 \cdot 2} = 0 \quad \checkmark$$

$$(3x-2)(x+1) = 0$$

$$\begin{array}{rcl} 3x-2 & = & 0 \\ \hline +2 & +2 & \\ & & \end{array} \qquad \begin{array}{rcl} x+1 & = & 0 \\ \hline -1 & -1 & \\ & & \end{array}$$

$$\frac{3x}{3} = \frac{2}{3}$$

$$x = \frac{2}{3} \quad \text{OR} \quad x = -1$$

① Set = to zero

② Factor

③ Solve

$$\textcircled{6} \quad \begin{array}{rcl} 5x^2 - 3 & = & -14x \\ +14x & & +14x \\ & & \hline & & 0 \end{array}$$

$$\begin{array}{rcl} 5x^2 & + & 14x - 3 = 0 \quad \checkmark \\ 5x \cdot x & & 1 \cdot 3 \end{array}$$

$$(5x-1)(x+3)=0$$

$$\begin{array}{rcl} 5x-1 & = & 0 \\ \hline +1 & +1 & \\ & 1 & \end{array}$$

$$\begin{array}{rcl} x+3 & = & 0 \\ \hline -3 & -3 & \\ & -3 & \end{array}$$

$$\frac{5x}{5} = \frac{1}{5}$$

$$\boxed{x = \frac{1}{5} \text{ OR } x = -3}$$