

10 $x^2 - 12x + 27 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & -3 \\ -3 & -9 \end{array} \quad \begin{array}{l} 1 \cdot -27 \\ -3 \cdot -9 \end{array} \\ \hline 1 \quad -12 \quad 27 \end{array}$$

$(x-3)(x-9)$

$\hookrightarrow x-3=0 \quad \hookrightarrow x-9=0$
 $\quad \quad \quad +3 \quad +3 \quad \quad \quad +9 \quad +9$
 $\boxed{x=3} \quad \boxed{x=9}$

11 $x^2 - 5x - 14 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & 2 \\ 2 & -7 \end{array} \quad \begin{array}{l} 1 \cdot -14 \\ -2 \cdot -7 \end{array} \\ \hline 1 \quad -5 \quad -14 \end{array}$$

$(x+2)(x-7)$

$\hookrightarrow x+2=0 \quad \hookrightarrow x-7=0$
 $\quad \quad \quad -2 \quad -2 \quad \quad \quad +7 \quad +7$
 $\boxed{x=-2} \quad \boxed{x=7}$

12 $x^2 + x - 20 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & 5 \\ 5 & -4 \end{array} \quad \begin{array}{l} 1 \cdot -20 \\ 5 \cdot -4 \end{array} \\ \hline 1 \quad 1 \quad -20 \end{array}$$

$(x+5)(x-4)$

$\hookrightarrow x+5=0 \quad \hookrightarrow x-4=0$
 $\quad \quad \quad -5 \quad -5 \quad \quad \quad +4 \quad +4$
 $\boxed{x=-5} \quad \boxed{x=4}$

13 $x^2 - 3x - 40 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & -8 \\ -8 & 5 \end{array} \quad \begin{array}{l} 1 \cdot -40 \\ 5 \cdot -8 \end{array} \\ \hline 1 \quad -3 \quad -40 \end{array}$$

$(x-8)(x+5)$

$\hookrightarrow x-8=0 \quad \hookrightarrow x+5=0$
 $\quad \quad \quad +8 \quad +8 \quad \quad \quad -5 \quad -5$
 $\boxed{x=8} \quad \boxed{x=-5}$

14 $x^2 + 2x - 63 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & 9 \\ 9 & -7 \end{array} \quad \begin{array}{l} 1 \cdot -63 \\ 9 \cdot -7 \end{array} \\ \hline 1 \quad 2 \quad -63 \end{array}$$

$(x+9)(x-7)$

$\hookrightarrow x+9=0 \quad \hookrightarrow x-7=0$
 $\quad \quad \quad -9 \quad -9 \quad \quad \quad +7 \quad +7$
 $\boxed{x=-9} \quad \boxed{x=7}$

15 $x^2 + 10x - 75 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & 15 \\ 15 & -5 \end{array} \quad \begin{array}{l} 1 \cdot -75 \\ 15 \cdot -5 \end{array} \\ \hline 1 \quad 10 \quad -75 \end{array}$$

$(x+15)(x-5)$

$\hookrightarrow x+15=0 \quad \hookrightarrow x-5=0$
 $\quad \quad \quad -15 \quad -15 \quad \quad \quad +5 \quad +5$
 $\boxed{x=-15} \quad \boxed{x=5}$

16 $3x^2 + 31x + 36 = 0$

$$\begin{array}{r} 1 \cdot 3 \quad \begin{array}{cc} 3 & 4 \\ 4 & 9 \end{array} \quad \begin{array}{l} 1 \cdot 36 \\ 3 \cdot 4 \end{array} \\ \hline 3 \quad 31 \quad 36 \end{array}$$

$(3x+4)(x+9)$

$\hookrightarrow 3x+4=0 \quad \hookrightarrow x+9=0$
 $\quad \quad \quad -4 \quad -4 \quad \quad \quad -9 \quad -9$
 $\quad \quad \quad \frac{3x}{3} = \frac{-4}{3}$
 $\boxed{x=-\frac{4}{3}} \quad \boxed{x=-9}$

17 $2x^2 - 19x + 24 = 0$

$$\begin{array}{r} 1 \cdot 2 \quad \begin{array}{cc} 2 & -3 \\ -3 & -8 \end{array} \quad \begin{array}{l} 1 \cdot -24 \\ -2 \cdot -12 \\ -3 \cdot -8 \end{array} \\ \hline 2 \quad -19 \quad 24 \end{array}$$

$(2x-3)(x-8)$

$\hookrightarrow 2x-3=0 \quad \hookrightarrow x-8=0$
 $\quad \quad \quad +3 \quad +3 \quad \quad \quad +8 \quad +8$
 $\quad \quad \quad \frac{2x}{2} = \frac{3}{2}$
 $\boxed{x=\frac{3}{2}} \quad \boxed{x=8}$

18 $5x^2 + 23x + 26 = 0$

$$\begin{array}{r} 1 \cdot 5 \quad \begin{array}{cc} 5 & 13 \\ 13 & 2 \end{array} \quad \begin{array}{l} 1 \cdot 26 \\ 5 \cdot 2 \end{array} \\ \hline 5 \quad 23 \quad 26 \end{array}$$

$(5x+13)(x+2)$

$\hookrightarrow 5x+13=0 \quad \hookrightarrow x+2=0$
 $\quad \quad \quad -13 \quad -13 \quad \quad \quad -2 \quad -2$
 $\quad \quad \quad \frac{5x}{5} = \frac{-13}{5}$
 $\boxed{x=-\frac{13}{5}} \quad \boxed{x=-2}$

19 $2x^2 - 11x + 15 = 0$

$$\begin{array}{r} 1 \cdot 2 \quad \begin{array}{cc} 2 & -5 \\ 1 & -3 \end{array} \quad \begin{array}{l} -1 \cdot -15 \\ -3 \cdot -5 \end{array} \\ \hline 2 \quad -11 \quad 15 \end{array}$$

$(2x-5)(x-3)$

$\hookrightarrow 2x-5=0$ $\hookrightarrow x-3=0$

$$\begin{array}{r} +5 \quad +5 \\ \hline \end{array} \quad \begin{array}{r} +3 \quad +3 \\ \hline \end{array}$$

$\frac{2x}{2} = \frac{5}{2}$

$x = \frac{5}{2}$

$x = 3$

20 $5x^2 + 28x + 32 = 0$

$$\begin{array}{r} 1 \cdot 5 \quad \begin{array}{cc} 5 & 8 \\ 1 & 4 \end{array} \quad \begin{array}{l} 1 \cdot 32 \\ 2 \cdot 16 \\ 4 \cdot 8 \end{array} \\ \hline 5 \quad 28 \quad 32 \end{array}$$

$(5x+8)(x+4)$

$\hookrightarrow 5x+8=0$ $\hookrightarrow x+4=0$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array} \quad \begin{array}{r} -4 \quad -4 \\ \hline \end{array}$$

$\frac{5x}{5} = \frac{-8}{5}$

$x = -\frac{8}{5}$

$x = -4$

21 $x^2 - 14x + 49 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & -7 \\ 1 & -7 \end{array} \quad \begin{array}{l} -1 \cdot -14 \\ -7 \cdot -7 \end{array} \\ \hline 1 \quad -14 \quad 49 \end{array}$$

$(x-7)(x-7)$

$\hookrightarrow (x-7)^2$

$\hookrightarrow x-7=0$

$$\begin{array}{r} +7 \quad +7 \\ \hline \end{array}$$

$x = 7$

22 $9x^2 + 48x + 64 = 0$

$$\begin{array}{r} 1 \cdot 9 \quad \begin{array}{cc} 3 & 8 \\ 3 & 8 \end{array} \quad \begin{array}{l} 1 \cdot 64 \\ 2 \cdot 32 \\ 4 \cdot 16 \\ 8 \cdot 8 \end{array} \\ \hline 9 \quad 48 \quad 64 \end{array}$$

$(3x+8)(3x+8)$

$\hookrightarrow (3x+8)^2$

$\hookrightarrow 3x+8=0$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array}$$

$\frac{3x}{3} = \frac{-8}{3}$

$x = -\frac{8}{3}$

23 $81x^2 + 36x + 4 = 0$

$$\begin{array}{r} 1 \cdot 81 \quad \begin{array}{cc} 9 & 2 \\ 9 & 2 \end{array} \quad \begin{array}{l} 1 \cdot 4 \\ 2 \cdot 2 \end{array} \\ \hline 81 \quad 36 \quad 4 \end{array}$$

$(9x+2)(9x+2)$

$\hookrightarrow (9x+2)^2$

$\hookrightarrow 9x+2=0$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array}$$

$\frac{9x}{9} = \frac{-2}{9}$

$x = -\frac{2}{9}$

24 $x^2 - 4 = 0$

$$\begin{array}{r} 1 \cdot 1 \quad \begin{array}{cc} 1 & 2 \\ 1 & -2 \end{array} \quad \begin{array}{l} -1 \cdot 4 \\ 1 \cdot -4 \\ 2 \cdot -2 \end{array} \\ \hline 1 \quad 0 \quad -4 \end{array}$$

$(x+2)(x-2)$

$\hookrightarrow x+2=0$ $\hookrightarrow x-2=0$

$$\begin{array}{r} -2 \quad -2 \\ \hline \end{array} \quad \begin{array}{r} +2 \quad +2 \\ \hline \end{array}$$

$x = -2$

$x = 2$

25 $9x^2 - 1 = 0$

$$\begin{array}{r} 1 \cdot 9 \quad \begin{array}{cc} 3 & 1 \\ 3 & -1 \end{array} \quad \begin{array}{l} 1 \cdot -1 \\ 3 \cdot -3 \end{array} \\ \hline 9 \quad 0 \quad -1 \end{array}$$

$(3x+1)(3x-1)$

$\hookrightarrow 3x+1=0$ $\hookrightarrow 3x-1=0$

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

$\frac{3x}{3} = \frac{-1}{3}$

$x = -\frac{1}{3}$

$\frac{3x}{3} = \frac{1}{3}$

$x = \frac{1}{3}$