

Solve each equation by factoring. Show your work and check your answer by graphing, FOILING or using the box method.

1) $(x + 5)(x - 7) = 0$

$$\begin{array}{r} x+5=0 \\ -5 \quad -5 \\ \hline x=-5 \end{array} \quad \begin{array}{r} x-7=0 \\ +7 \quad +7 \\ \hline x=7 \end{array}$$

2) $(x - 4)(x - 12) = 0$

$$\begin{array}{r} x-4=0 \\ +4 \quad +4 \\ \hline x=4 \end{array} \quad \begin{array}{r} x-12=0 \\ +12 \quad +12 \\ \hline x=12 \end{array}$$

3) $(2x - 9)(x + 6) = 0$

$$\begin{array}{r} 2x-9=0 \\ +9 \quad +9 \\ \hline 2x=9 \\ \frac{2x}{2} = \frac{9}{2} \\ x=9/2 \end{array} \quad \begin{array}{r} x+6=0 \\ -6 \quad -6 \\ \hline x=-6 \end{array}$$

4) $(3x + 5)(4x - 3) = 0$

$$\begin{array}{r} 3x+5=0 \\ -5 \quad -5 \\ \hline 3x=-5 \\ \frac{3x}{3} = \frac{-5}{3} \\ x=-5/3 \end{array} \quad \begin{array}{r} 4x-3=0 \\ 4x=3 \\ x=3/4 \end{array}$$

5) $x^2 + 7x - 30 = 0$

$$\begin{array}{r} -30 \\ 10 \quad -3 \\ 7 \end{array} \quad (x+10)(x-3)=0$$

$$\begin{array}{r} x+10=0 \\ x=-10 \end{array} \quad \begin{array}{r} x-3=0 \\ +3=+3 \\ x=3 \end{array}$$

6) $x^2 + 8x + 16 = 0$

$$\begin{array}{r} 16 \\ 4 \quad 4 \\ 8 \end{array} \quad x+4=0$$

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

7) $x^2 - 8x = -15$

$$x^2 - 8x + 15 = 0$$

$$\begin{array}{r} 15 \\ -5 \quad -3 \\ -8 \end{array} \quad \begin{array}{r} x-5=0 \\ x=5 \end{array} \quad \begin{array}{r} x-3=0 \\ x=3 \end{array}$$

8) $2x^2 + 11x - 21 = 0$

$$\begin{array}{r} -21 \\ 14 \quad -3 \\ 11 \end{array} \quad \begin{array}{r} 2x^2 \\ 14x \\ x \\ x+7=0 \\ x=-7 \end{array} \quad \begin{array}{r} 2x^2 \\ -3x \\ 2x \\ -3 \\ 2x-3=0 \\ 2x=3 \\ x=3/2 \end{array}$$

9) $4x^2 + 5x = 6$

$$4x^2 + 5x - 6 = 0$$

$$\begin{array}{r} -6 \\ 8 \quad -3 \\ 5 \end{array} \quad \begin{array}{r} 4x^2 \\ 8x \\ x \\ x+2=0 \\ x=-2 \end{array} \quad \begin{array}{r} 4x-3=0 \\ +3=+3 \\ 4x=3 \\ x=3/4 \end{array}$$

10) $9x^2 - 1 = 0$

$$9x^2 = 1$$

$$x^2 = 1/9$$

$$x = \pm 1/3$$

11) $5x^2 - 9x + 4 = 0$

$$\begin{array}{r} 4 \\ -4 \quad -5 \\ -9 \end{array} \quad \begin{array}{r} 5x^2 \\ -4x \\ -5x \\ 5x-4=0 \\ x=4/5 \end{array} \quad \begin{array}{r} x-1=0 \\ x=1 \end{array}$$

12) $x^2 + 12x = -35$

$$x^2 + 12x + 35 = 0$$

$$\begin{array}{r} 35 \\ 7 \quad 5 \\ 12 \end{array} \quad \begin{array}{r} x+7=0 \\ x=-7 \end{array} \quad \begin{array}{r} x+5=0 \\ x=-5 \end{array}$$

13) $x^2 = 16$

$$x = \pm 4$$

14) $2x^2 + 2x - 24 = 0$

$$2(x^2 + x - 12) = 0$$

$$\begin{array}{r} -12 \\ 4 \quad -3 \\ 1 \end{array} \quad \begin{array}{r} x+4=0 \\ x=-4 \end{array} \quad \begin{array}{r} x-3=0 \\ x=3 \end{array}$$

15) $3x^2 - 12x = 63$

$$3x^2 - 12x - 63 = 0$$

$$3(x^2 - 4x - 21) = 0$$

$$\begin{array}{r} -21 \\ -7 \quad 3 \\ -4 \end{array} \quad \begin{array}{r} x-7=0 \\ x=7 \end{array} \quad \begin{array}{r} x+3=0 \\ x=-3 \end{array}$$

16) $5x^2 + 5x - 10 = 0$

$$5(x^2 + x - 2) = 0$$

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