

Solve each equation by factoring.

1) $2k^2 - 3k - 2 = 0$

4.1
2.2

$$\frac{(2k^2 - 4k) + (k - 2)}{2k \quad 1} = 0$$

$$k = 2$$

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

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

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

$$k-2 = 0 \quad 2k+1 = 0$$

3) $2r^2 - r - 6 = 0$

12.1
6.2
4.3

$$\frac{(2r^2 - 4r) + (3r - 6)}{2r \quad 3} = 0$$

$$2r(r-2) + 3(r-2) = 0$$

$$(r-2)(2r+3) = 0$$

$$r-2 = 0 \quad 2r+3 = 0$$

$$r = 2 \quad r = -\frac{3}{2}$$

5) $5x^2 - 8x - 4 = 0$

20.1
10.2
5.4

$$\frac{(5x^2 - 10x) + (2x - 4)}{5x \quad 2} = 0$$

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

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

$$x-2 = 0 \quad 5x+2 = 0$$

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

7) $6n^2 - 5n - 7 = -3$

24.1
12.2
8.3
6.4

$$6n^2 - 5n - 4 = 0$$

$$\frac{(6n^2 - 8n) + (3n - 4)}{2n \quad 1} = 0$$

$$2n(3n-4) + 1(3n-4) = 0$$

$$(3n-4)(2n+1) = 0$$

$$3n-4 = 0 \quad 2n+1 = 0$$

$n = \frac{4}{3}$
 $n = -\frac{1}{2}$

2) $3x^2 - 14x + 15 = 0$

45.1
15.3
9.5

$$\frac{(3x^2 - 9x) - (5x - 15)}{3x \quad -5} = 0$$

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

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

$$x-3 = 0 \quad 3x-5 = 0$$

$x = 3 \quad x = \frac{5}{3}$

4) $3m^2 + 4m - 4 = 0$

12.1
6.2
4.3

$$\frac{(3m^2 + 6m) - (2m - 4)}{3m \quad -2} = 0$$

$$3m(m+2) - 2(m+2) = 0$$

$$(m+2)(3m-2) = 0$$

$$m+2 = 0 \quad 3m-2 = 0$$

$$m = -2 \quad m = \frac{2}{3}$$

6) $2m^2 - m = 3$

6.1
3.2

$$2m^2 - m - 3 = 0$$

$$\frac{(2m^2 - 3m) + (2m - 3)}{m \quad 1} = 0$$

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

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

$$2m-3 = 0 \quad m+1 = 0$$

$$m = -1 \quad m = \frac{3}{2}$$

8) $5m^2 + 3m + 2 = 4$

10.1
5.2

$$5m^2 + 3m - 2 = 0$$

$$\frac{(5m^2 + 5m) - (2m - 2)}{5m \quad -2} = 0$$

$$5m(m+1) - 2(m+1) = 0$$

$$(m+1)(5m-2) = 0$$

$$m+1 = 0 \quad 5m-2 = 0$$

$$m = -1 \quad m = \frac{2}{5}$$

$$9) 5v^2 - 9v + 1 = -3$$

$$5v^2 - 9v + 4 = 0$$

$$\left(\frac{5v^2 - 5v}{5v} + \frac{-4v + 4}{-4} \right) = 0$$

$$5v(v-1) - 4(v-1) = 0$$

$$(v-1)(5v-4) = 0$$

$$\begin{array}{r} 20 \cdot 1 \\ 10 \cdot 2 \\ \hline 5 \cdot 4 \end{array}$$

$$\rightarrow v-1=0 \quad 5v-4=0$$

$$v=1 \quad \& \quad 4/5$$

$$11) 3n^2 + 16n + 3 = -2$$

$$3n^2 + 16n + 5 = 0$$

$$\left(\frac{3n^2 + 15n}{3n} + \frac{1n + 5}{1} \right) = 0$$

$$3n(n+5) + 1(n+5) = 0$$

$$(n+5)(3n+1) = 0$$

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

$$\rightarrow n+5=0 \quad 3n+1=0$$

$$n=-5 \quad \& \quad -1/3$$

$$13) 3a^2 - 8a - 7 = -4$$

$$3a^2 - 8a - 3 = 0$$

$$\left(\frac{3a^2 - 9a}{3a} + \frac{1a - 3}{1} \right) = 0$$

$$3a(a-3) + 1(a-3) = 0$$

$$(a-3)(3a+1) = 0$$

$$\begin{array}{r} 9 \cdot 1 \\ \hline 3 \cdot 3 \end{array}$$

$$\rightarrow a-3=0 \quad 3a+1=0$$

$$a=3 \quad \& \quad -1/3$$

Factor each completely.

$$15) 9k^2 - 25$$

$$(3k)^2 - (5)^2$$

$$(3k-5)(3k+5)$$

$$10) 5x^2 + 9x + 8 = 4$$

$$5x^2 + 9x + 4 = 0$$

$$\left(\frac{5x^2 + 5x}{5x} + \frac{4x + 4}{4} \right) = 0$$

$$5x(x+1) + 4(x+1) = 0$$

$$(x+1)(5x+4) = 0$$

$$x+1=0 \quad 5x+4=0$$

$$\begin{array}{r} 20 \cdot 1 \\ 10 \cdot 2 \\ \hline 5 \cdot 4 \end{array}$$

$$x=-1 \quad \& \quad -4/5$$

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

$$4n^2 - n + 0 = 0$$

common term $4n^2 - n = 0$

$$n(4n-1) = 0$$

$$n=0 \quad 4n-1=0$$

$$n=0 \quad \& \quad 1/4$$

$$14) 10b^2 - 13b - 7 = -4$$

$$10b^2 - 13b - 3 = 0$$

$$\left(\frac{10b^2 - 15b}{5b} + \frac{2b - 3}{1} \right) = 0$$

$$5b(2b-3) + 1(2b-3) = 0$$

$$(2b-3)(5b+1) = 0$$

$$\begin{array}{r} 30 \cdot 1 \\ 15 \cdot 2 \\ \hline 10 \cdot 3 \\ 6 \cdot 5 \end{array}$$

$$2b-3=0 \quad 5b+1=0$$

$$b=3/2 \quad \& \quad -1/5$$

$$16) 25p^2 - 9$$

$$(5p)^2 - (3)^2$$

$$(5p-3)(5p+3)$$

$$17) n^2 - 4$$

$$(n)^2 - (2)^2$$

$$(n-2)(n+2)$$

$$18) 16n^2 - 9$$

$$(4n)^2 - (3)^2$$

$$(4n-3)(4n+3)$$