

p. 666) 15-23 odd, 28-36

- ⑮ -6, 12      ⑰ -7, 3      ⑲ -10.5, -0.5      ⑳ -0.80, 8.80  
 ㉓ -2.5, -0.5      ㉔ -1.32, 5.32      ㉕ 0.86, 15.14      ㉖ -3.67, -0.33  
 ㉗ -0.30, 12.30      ㉘ -0.65, 4.65

### SOLUTIONS

⑮  $n^2 - 6n = 72$        $-\frac{6}{2} = (-3)^2 = 9$

$$n^2 - 6n + 9 = 72 + 9$$

$$\sqrt{(n-3)^2} = \sqrt{81}$$

$$\begin{array}{r} n-3 = \pm 9 \\ +3 \quad +3 \\ \hline n = 3 \pm 9 \end{array}$$

$$\begin{array}{l} / \quad \backslash \\ 3+9 \quad 3-9 \\ \boxed{12} \quad \boxed{-6} \end{array}$$

⑰  $y^2 + 4y - 21 = 0$

$$\frac{\quad}{+21 \quad +21}$$

$$y^2 + 4y = 21$$

$$\frac{4}{2} = (2)^2 = 4$$

$$y^2 + 4y + 4 = 21 + 4$$

$$\sqrt{(y+2)^2} = \sqrt{25}$$

$$\begin{array}{r} y+2 = \pm 5 \\ -2 \quad -2 \\ \hline y = -2 \pm 5 \end{array}$$

$$\begin{array}{l} / \quad \backslash \\ -2+5 \quad -2-5 \\ \boxed{3} \quad \boxed{-7} \end{array}$$

⑲  $z^2 + 11z = -\frac{21}{4}$        $(\frac{11}{2})^2 = \frac{121}{4}$

$$z^2 + 11z + \frac{121}{4} = -\frac{21}{4} + \frac{121}{4}$$

$$\sqrt{(z + \frac{11}{2})^2} = \sqrt{25}$$

$$\begin{array}{r} z + \frac{11}{2} = \pm 5 \\ -\frac{11}{2} \quad -\frac{11}{2} \\ \hline z = -\frac{11}{2} \pm 5 \end{array}$$

$$\begin{array}{l} / \quad \backslash \\ -\frac{11}{2} + 5 \quad -\frac{11}{2} - 5 \\ -\frac{11}{2} + \frac{10}{2} \quad -\frac{11}{2} - \frac{10}{2} \\ -\frac{1}{2} = \boxed{-0.5} \quad -\frac{21}{2} = \boxed{-10.5} \end{array}$$

㉕  $k^2 - 8k - 7 = 0$

$$\frac{\quad}{+7 \quad +7}$$

$$k^2 - 8k = 7$$

$$-\frac{8}{2} = (-4)^2 = 16$$

$$k^2 - 8k + 16 = 7 + 16$$

$$\sqrt{(k-4)^2} = \sqrt{23}$$

$$\begin{array}{r} k-4 = \pm \sqrt{23} \\ +4 \quad +4 \\ \hline k = 4 \pm \sqrt{23} \end{array}$$

$$\begin{array}{l} / \quad \backslash \\ 4 + \sqrt{23} \quad 4 - \sqrt{23} \\ \boxed{8.80, -0.80} \end{array}$$

$$-\frac{1}{2} = -0.5 \quad -\frac{21}{2} = -10.5$$

$$0.00, -0.00$$

$$\begin{aligned} (23) \quad m^2 + 3m + \frac{5}{4} &= 0 \\ &\quad -\frac{5}{4} \quad -\frac{5}{4} \\ \hline m^2 + 3m &= -\frac{5}{4} \\ m^2 + 3m + \frac{9}{4} &= -\frac{5}{4} + \frac{9}{4} \\ \sqrt{\left(m + \frac{3}{2}\right)^2} &= \sqrt{1} \\ m + \frac{3}{2} &= \pm 1 \\ &\quad -\frac{3}{2} \quad -\frac{3}{2} \\ \hline m &= -\frac{3}{2} \pm 1 \\ &\quad / \quad \backslash \\ -\frac{3}{2} + 1 \quad &\quad -\frac{3}{2} - 1 \\ -\frac{1}{2} &= -0.5 \quad -\frac{5}{2} = -2.5 \end{aligned}$$

$$\begin{aligned} (28) \quad 2x^2 - 8x - 14 &= 0 \\ &\quad +14 \quad +14 \\ \hline 2x^2 - 8x &= 14 \\ \frac{2(x^2 - 4x)}{2} &= \frac{14}{2} \\ x^2 - 4x &= 7 \quad \frac{-4}{2} = (-2)^2 = 4 \\ x^2 - 4x + 4 &= 7 + 4 \\ \sqrt{(x-2)^2} &= \sqrt{11} \\ x - 2 &= \pm \sqrt{11} \\ &\quad +2 \quad +2 \\ \hline x &= 2 \pm \sqrt{11} \\ &\quad / \quad \backslash \\ 2 + \sqrt{11} \quad &\quad 2 - \sqrt{11} \\ 5.32 &\quad -1.32 \end{aligned}$$

$$\begin{aligned} (30) \quad 3x^2 - 48x + 39 &= 0 \\ &\quad -39 \quad -39 \\ \hline 3x^2 - 48x &= -39 \\ \frac{3(x^2 - 16x)}{3} &= \frac{-39}{3} \\ x^2 - 16x &= -13 \quad \frac{-16}{2} = (-8)^2 = 64 \\ x^2 - 16x + 64 &= -13 + 64 \\ \sqrt{(x-8)^2} &= \sqrt{51} \\ x - 8 &= \pm \sqrt{51} \\ &\quad +8 \quad +8 \\ \hline x &= 8 \pm \sqrt{51} \\ &\quad / \quad \backslash \\ 8 + \sqrt{51} \quad &\quad 8 - \sqrt{51} \\ 15.14 &\quad 0.86 \end{aligned}$$

$$\begin{aligned} (32) \quad 9n^2 + 36n + 11 &= 0 \\ &\quad -11 \quad -11 \\ \hline 9n^2 + 36n &= -11 \\ \frac{9(n^2 + 4n)}{9} &= \frac{-11}{9} \\ n^2 + 4n &= -\frac{11}{9} \quad \frac{4}{2} = (2)^2 = 4 \\ n^2 + 4n + 4 &= -\frac{11}{9} + 4 \\ \sqrt{(n+2)^2} &= \sqrt{\frac{25}{9}} \\ n + 2 &= \pm \frac{5}{3} \\ &\quad -2 \quad -2 \\ \hline n &= -2 \pm \frac{5}{3} \\ &\quad / \quad \backslash \\ -2 + \frac{5}{3} \quad &\quad -2 - \frac{5}{3} \\ -\frac{1}{3} &\quad -\frac{11}{3} \end{aligned}$$

$$\textcircled{34} \quad \frac{3p^2 - 30p - 11}{-6p + 11} = \frac{6p}{-6p + 11}$$

$$3p^2 - 36p = 11$$

$$\frac{3(p^2 - 12p)}{3} = \frac{11}{3}$$

$$p^2 - 12p = \frac{11}{3} \quad -\frac{12}{2} = (-6)^2 = 36$$

$$p^2 - 12p + 36 = \frac{11}{3} + 36$$

$$\sqrt{(p-6)^2} = \sqrt{\frac{119}{3}}$$

$$\frac{p-6}{+6} = \pm \frac{\sqrt{\frac{119}{3}}}{+6}$$

$$p = 6 \pm \frac{\sqrt{\frac{119}{3}}}{6}$$

$$p \approx \boxed{-0.30, 12.30}$$

$$\textcircled{36} \quad \frac{7m^2 + 24m - 2}{-m^2} = \frac{m^2 - 9}{+2 - m^2 + 2}$$

$$6m^2 + 24m = -7$$

$$\frac{6(m^2 + 4m)}{6} = \frac{-7}{6}$$

$$m^2 + 4m = -\frac{7}{6} \quad \frac{4}{2} = 2^2$$

$$m^2 + 4m + 4 = -\frac{7}{6} + 4 = 4$$

$$\sqrt{(m+2)^2} = \sqrt{\frac{17}{6}}$$

$$\frac{m+2}{-2} = \pm \frac{\sqrt{\frac{17}{6}}}{-2}$$

$$m = -2 \pm \sqrt{\frac{17}{6}}$$