

• p. 232)#14-17, 23, 24, 26-28

⑭  $x = -3/4$     ⑮  $x = 5$     ⑯  $x = 3$     ⑰ no solution    ⑲  $x = 3 \pm \sqrt{2}$

⑳  $x = \frac{-3 \pm \sqrt{31}}{2}$     ㉑  $x = \frac{1 \pm \sqrt{13}}{6}$     ㉒ no solution    ㉓  $x = -5/3$

⑭  $\frac{4x}{x+4} \frac{(x-1)}{(x-1)} + \frac{3}{x-1} \frac{(x+4)}{(x+4)} = \frac{15}{(x+4)(x-1)}$   
 $4x^2 - 4x + 3x + 12 = 15$   
 $4x^2 - x - 3 = 0$   
 $(4x + 3)(x - 1) = 0$   
 $x = -3/4, *$

⑮  $\frac{x-3}{x} \frac{(x+1)}{(x+1)} - \frac{3}{x+1} \frac{(x)}{(x)} + \frac{3}{x^2+x} = \frac{0}{x(x+1)}$   
 $x^2 - 2x - 3 - 3x + 3 = 0$   
 $x^2 - 5x = 0$   
 $x(x-5) = 0$   
 $x = \cancel{0}, 5$

⑯  $\frac{x+2}{x} \frac{(x-1)}{(x-1)} - \frac{4}{x-1} \frac{x}{x} + \frac{2}{x(x-1)} = 0$   
 $x^2 + x - 2 - 4x + 2 = 0$   
 $x^2 - 3x = 0$   
 $x(x-3) = 0$   
 $x = \cancel{0}, 3$

⑰  $\frac{3}{x+2} \frac{x}{x} + \frac{6}{x(x+2)} = \frac{3-x}{x} \frac{(x+2)}{(x+2)}$   
 $3x + 6 = -x^2 + x + 6$   
 $x^2 + 2x = 0$   
 $x(x+2) = 0$   
 $x = \cancel{0}, -2$  No solution

㉓  $\frac{2}{x-1} + \frac{x(x-1)}{(x-1)} = \frac{5(x-1)}{(x-1)}$   
 $2 + x^2 - x = 5x - 5$   
 $x^2 - 6x + 7 = 0$   
 $x = \frac{6 \pm \sqrt{36 - 4(7)}}{2}$   
 $x = \frac{6 \pm \sqrt{8}}{2} = \frac{6 \pm 2\sqrt{2}}{2}$   
 $x = 3 \pm \sqrt{2}$

㉔  $\frac{x^2 - 6x + 5}{x^2 - 2} = \frac{3}{1}$   
 $x^2 - 6x + 5 = 3x^2 - 6$   
 $0 = 2x^2 + 6x - 11$   
 $x = \frac{-6 \pm \sqrt{36 - 4(-22)}}{2(2)}$   
 $x = \frac{6 \pm \sqrt{124}}{4} = \frac{6 \pm 2\sqrt{31}}{4} = \frac{-3 \pm \sqrt{31}}{2}$

㉑  $\frac{3x}{x+2} \frac{(x-1)}{(x-1)} + \frac{2}{x-1} \frac{(x+2)}{(x+2)} = \frac{5}{(x+2)(x-1)}$   
 $3x^2 - 3x + 2x + 4 = 5$   
 $3x^2 - x - 1 = 0$   
 $x = \frac{1 \pm \sqrt{1 - 4(-3)}}{6} = \frac{1 \pm \sqrt{13}}{6}$

㉒  $\frac{4x}{x+4} \frac{(x-1)}{(x-1)} + \frac{5}{x-1} \frac{(x+4)}{(x+4)} = \frac{15}{(x+4)(x-1)}$   
 $4x^2 - 4x + 5x + 20 = 15$   
 $4x^2 + x + 5 = 0$   
 $x = \frac{-1 \pm \sqrt{1 - 4(20)}}{2(4)}$  ← no real solution!

㉓  $\frac{3x}{x+1} \frac{(x-2)}{(x-2)} + \frac{5}{x-2} \frac{(x+1)}{(x+1)} = \frac{15}{(x+1)(x-2)}$   
 $3x^2 - 6x + 5x + 5 = 15$   
 $3x^2 - x - 10 = 0$   
 $(3x + 5)(x - 2) = 0$   
 $x = -5/3, *$