

P-4 Solution Set

1. Fractional Expression
3. Rational Expression
5. Fractional Expression

$$\begin{aligned} 7. \quad & \frac{7x+35}{(x+5)(2x-1)} \\ &= \frac{7(x+5)}{(x+5)(2x-1)} \\ &= \frac{7}{2x-1}, x \neq -5 \end{aligned}$$

$$9. \quad \frac{2}{x+3}, x \neq -2$$

$$11. \quad \frac{x+5}{x-6}, x \neq -4$$

$$13. \quad \frac{5}{2x}, x \neq 0$$

$$\begin{aligned} 15. \quad & \frac{27}{4x^2} \div \frac{18}{x^4} \\ &= \frac{27}{4x^2} \cdot \frac{x^4}{18} \\ &= \frac{3x^2}{8}, x \neq 0 \end{aligned}$$

$$17. \quad \frac{2(2x^2+3x+2)}{x-6}, x \neq 2$$

$$19. \quad \frac{4(x-5)}{5(x+3)}, x \neq -\frac{1}{2}$$

$$21. \quad \frac{1}{5(x+3)}, x \neq 3, \frac{4}{3}$$

$$23. \quad \frac{x^2+6x+8}{x^2-5x+4}, x \neq 3, -3$$

$$25. \quad \frac{x^2-7x+6}{x^3-3x^2+12x-36}$$

$$27. \quad \frac{3}{4}(3x+4), x \neq 4, \frac{4}{3}$$

$$29. \quad \frac{5(3x-4)}{6x(2x-3)}, x \neq 0$$

$$31. \quad \frac{1}{4}x^2(x+4), x \neq 4, -3$$

$$33. \quad 7x+21$$

$$\begin{aligned} 35. \quad & \frac{3}{x+2} = \frac{?}{5x^2+10x} \\ \Rightarrow & \frac{3}{x+2} = \frac{5x \cdot 3}{5x(x+2)} \\ \Rightarrow & ? = 15x \end{aligned}$$

$$37. \quad -3(x+2)$$

$$39. \quad 6(x+1)$$

$$41. \quad (x+5)(x-3)$$

$$43. \quad x^2-1$$

$$45. \quad \frac{5x^2+10x+15}{x+2}$$

$$47. \quad \frac{x+3}{x}$$

$$\begin{aligned}
 49. \quad & \frac{3x}{x^2-9} - \frac{2x-3}{x^2-9} \\
 &= \frac{3x-2x+3}{x^2-9} \\
 &= \frac{x+3}{(x+3)(x-3)} \\
 &= \frac{1}{x-3}, x \neq -3
 \end{aligned}$$

$$51. \frac{9x-36}{x^2+2x-8}$$

$$53. \frac{10x+16}{x^2+2x}$$

$$55. \frac{x^2-24x+5}{25-x^2}$$

$$57. \frac{2x+1}{x^2-4}$$

$$59. \frac{17}{8-4x}$$

$$61. \frac{2x^2-x+5}{x^3+5x^2+2x-8}$$

$$63. \frac{3x^2+6x-4}{x(x^2-4)}$$

$$65. 4x+5 = (2x+1)2+3$$

$$67. 2x^2-6x+9 = (x-4)(2x+2)+7$$

$$\begin{array}{r}
 2x^2 + 3x + \frac{8}{3} \\
 69. \quad 3x-5 \overline{) 6x^3 - x^2 - 7x + 4} \\
 \underline{6x^3 - 10x^2} \phantom{+ 4} \\
 9x^2 - 7x \phantom{+ 4} \\
 \underline{9x^2 - 15x} \phantom{+ 4} \\
 8x + 4 \phantom{+ 4} \\
 \underline{8x - \frac{40}{3}} \phantom{+ 4} \\
 \frac{52}{3}
 \end{array}$$

$$\therefore 6x^3 - x^2 - 7x + 4 = (3x-5)\left(2x^2 + 3x + \frac{8}{3}\right) + \frac{52}{3}$$

$$71. 2x^2 + 4x + 3 = (x^2 + x + 1)2 + (2x + 1)$$

$$73. 9x^3 - 6x^2 - 5x + 3 = (3x^2 + 2x - 5)(3x - 4) + (18x + 23)$$

$$75. \frac{3x-5}{x-4} = 3 + \frac{7}{x-4}$$

$$77. \begin{array}{r} x+3 \\ x+5 \overline{)x^2+8x-3} \\ \underline{x^2+5x} \phantom{-3} \\ 3x-3 \\ \underline{3x+15} \\ -18 \end{array}$$

$$\therefore \frac{x^2+8x-3}{x+5} = x+3 - \frac{18}{x+5}$$

$$79. \frac{2x^3+4x^2+5x-7}{x-6} = 2x^2+10x+65 + \frac{383}{x-6}$$

$$81. \frac{x^3+3x^2-7x+8}{x^2+2x+5} = x+1 + \frac{14x-3}{x^2+2x+5}$$

$$83. \frac{2x^4+8x^2+1}{x^2-5x+6} = 2x^2+10x+46 + \frac{170x-269}{x^2-5x+6}$$

$$85. \begin{array}{r|rrrr} -2 & 4 & 8 & -9 & -18 \\ & & -8 & 0 & 18 \\ \hline & 4 & 0 & -9 & 0 \text{ Remainder} \end{array}$$

$x+2$  is a factor since the remainder is zero.

87.  $x+2$  is not a factor since the remainder is nonzero. The quotient is  $x^3-5x^2+10x-18$  and the remainder is 31.

$$89. \begin{aligned} & \frac{x-\frac{1}{x}}{1-\frac{1}{x}} \\ & \frac{x^2-1}{x^2-1} \\ & = \frac{x}{x-1} \\ & = \frac{x}{(x+1)(x-1)} \cdot \frac{x}{(x-1)} \\ & = x+1, x \neq 0,1 \end{aligned}$$

$$91. -\frac{2}{x(x+2)}, x \neq 2$$

93. c is the only true statement.

$$95. \frac{12x+8}{4x+2} = \frac{12x}{4x+2} + \frac{8}{4x+2} \neq \frac{12x}{4x} + \frac{8}{2}$$

$$97. \frac{2x^3 + 7x^2 + 3x - 5}{2x + 5} = x^2 + x - 1, \text{ Remainder} = 0$$

99.  $(x+a)$  is a factor of  $x^n + a^n$  for even  $n$ .

$$101. \text{ a. } c = \frac{100,000 - 1000p}{p}$$

$$= -1000 + \frac{100,000}{p}$$

$$\text{b. If } p = 100, c = -1000 + \frac{100,000}{100}$$

$$= -1000 + 1000$$

$$= 0$$

c.

