Chapter 7 Test Review p.510

(7.1)

1. $(-\infty, \infty)$

3. $x-5 \neq 0$

$x \neq 5$

$(-\infty, 5) \cup (5, \infty)$

5. $x^2+8x=0$

$x(x+8)=0$

$x \neq 0$ $\quad x+8 \neq 0$

$x \neq -8$

D: $(-\infty, -8) \cup (-8, 0) \cup (0, \infty)$

7. $\frac{x-12}{12-x} = \frac{x-12}{-x+12} = \frac{x-12}{-1(x-12)} = \frac{1}{-1} = -1$

9. $\frac{x+7}{x^2-49} = \frac{x+7}{(x+7)(x-7)} = \frac{1}{x-7}$

11. $\frac{(x^2+xa)+(xb+ab)}{(x^2-xc)+(bx-bc)} = \frac{x(x+a)+b(x+a)}{x(x-c)+b(x-c)} = \frac{(x+b)(x+a)}{(x+b)(x-c)} = \frac{x+a}{x-c}$

13. $\frac{4-x}{x^3-64} = \frac{-x+4}{(x-4)(x^2+4x+16)} = \frac{-1(x-4)}{(x-4)(x^2+4x+16)} = \frac{-1}{(x^2+4x+16)}$

15. $C(x) = \frac{35x+4200}{x}$ if $x=50$

$C(50) = \frac{35(50)+4200}{(50)} = \frac{5950}{50} = C(50) = \$119$

(7.2)

17. $\frac{15x^3y^2}{7} \cdot \frac{7}{15xy^3} = \frac{3x^3y^2}{xy^3} = \boxed{\frac{3x^2}{y}}$

19. $\frac{x^2-9}{x^2-4} \cdot \frac{x-2}{x+3} = \frac{(x+3)(x-3)}{(x+2)(x-2)} \cdot \frac{x-2}{x+3} = \boxed{\frac{x-3}{x+2}}$

21. $\frac{x^2-5x-24}{x^2-x-12} \cdot \frac{x^2+x-6}{x^2-10x+16} = \frac{(x-8)(x+3)}{(x-4)(x+3)} \cdot \frac{(x+3)(x-2)}{(x-8)(x-2)}$

$= \boxed{\frac{(x+3)}{(x-4)}}$

23. $\frac{x^2+x-42}{(x-3)} \cdot \frac{(x-3)^2}{(x+7)} = \frac{(x+7)(x-6)}{(x-3)} \cdot \frac{(x-3)(x-3)}{(x+7)} = \boxed{(x-6)(x-3)}$

25. $\frac{2x^2-9x+9}{8x-12} \cdot \frac{2x}{x^2-3x} = \frac{(2x^2-6x-3x+9)}{4(2x-3)} \cdot \frac{2x}{x(x-3)}$

a·c: 2·9 = 18; −6, −3; −9; b

$\frac{2x(x-3)-3(x-3)}{4(2x-3)} \cdot \frac{2x}{x(x-3)} = \frac{(2x-3)(x-3)}{2\cancel{4}(2x-3)} \cdot \frac{\cancel{2x}^{1}}{x(x-3)} = \boxed{\frac{1}{2}}$

27. $\frac{x-y}{4} \cdot \frac{16x+24}{(y^2-2y-xy+2x)} = \frac{x-y}{\cancel{4}_{1}} \cdot \frac{\cancel{8}^{2}(2x+3)}{(y-x)(y-2)} = \boxed{\frac{2(2x+3)}{-1(y-2)}}$

$y(y-2)-x(y+2)$; $-1(x-y)$

(7.3)

29. $\frac{x}{x^2+9x+14} + \frac{7}{x^2+9x+14} = \frac{x+7}{(x+7)(x+2)} = \boxed{\frac{1}{x+2}}$

31. $\frac{4x-5}{3x^2} - \frac{2x+5}{3x^2} = \frac{4x-5-2x-5}{3x^2} = \boxed{\frac{2x-10}{3x^2}}$ or $\boxed{\frac{2(x-5)}{3x^2}}$

33. $\frac{x+4}{2x} \cdot \frac{3}{7x}$ $\boxed{\text{LCD: } 14x}$

35. $\frac{5}{7x} = \frac{\boxed{10x^2y}}{14x^3y}$ $(2x^2y)$

37. $\frac{(x+2)(x+(-5))}{x^2+11x+18} = \frac{\boxed{(x+2)(x-5)}}{(x+2)(x+9)(x-5)}$ or $\boxed{x^2-3x-10}$

(7.4)

39. $\frac{4}{5x^2} - \frac{6}{y}$ LCD: $5x^2y$

$\frac{4^{(y)}}{5x^2} - \frac{6^{(5x^2)}}{y}$

$\frac{4y - 30x^2}{5x^2y} = \frac{-30x^2 + 4y}{5x^2y}$

41. $\frac{4}{x+3} - \frac{2(x+3)}{1(x+3)}$ LCD: $x+3$

$\frac{4-2(x+3)}{x+3} = \frac{4-2x-6}{x+3} = \frac{-2x-2}{x+3}$ OR $\frac{-2(x+1)}{x+3}$

42. $\frac{3(x-1)}{x^2+2x-8} + \frac{2(x+4)}{x^2-3x+2}$ LCD: $(x+4)(x-2)(x-1)$

$(x+4)(x-2)$ $\quad (x-2)(x-1)$

$\frac{3(x-1)+2(x+4)}{(x+4)(x-2)(x-1)} = \frac{3x-3+2x+8}{(x+4)(x-2)(x-1)} = \frac{5x+5}{(x+4)(x-2)(x-1)}$

43. $\frac{2x-5}{6x+9} - \frac{4}{2x^2+3x}$ LCD: $3x(2x+3)$

$3(2x+3)$ $\quad x(2x+3)$

$\frac{x^{(x)}(2x-5) - 4^{(3)}(3)}{3x(2x+3)} = \frac{2x^2-5x-12}{3x(2x+3)}$

a·c: $2 \cdot -12 = -24$; $-8 \times +3$; -5; b

$(2x^2-8x)+(3x-12)$

$2x(x-4)+3(x-4)$

$= \frac{(2x+3)(x-4)}{3x(2x+3)} = \frac{x-4}{3x}$

45. $\frac{x+2}{4x}$ $\quad \frac{x}{8}$ LCD: $4x$

$P = 2l + 2w$

$P = 2(\frac{x}{4}) + 2(\frac{x+2}{4x})$ $\quad (x)$ $\quad (z)$

$= \frac{x}{4} + \frac{x+2}{2x}$

$= \frac{x^2+2x+4}{4x} =$

(7.5)

47. $\frac{n}{10} = 9 - \frac{n}{5}$ LCD: 10

$n = 90 - 2n$

$3n = 90$

$\boxed{n = 30}$

49. $\frac{y}{2y+2} + \frac{2y-16}{4y+4} = \frac{y-3}{y+1}$ LCD: $8(y+1)$

$4y + 4y - 32 = 8y - 24$

$8y - 32 = 8y - 24$

$\boxed{-32 \neq -24}$ $\boxed{\text{no solution}}$

51. $\frac{x-3}{x+1} - \frac{x-6}{x+5} = \frac{0}{1}$ LCD: $(x+1)(x+5)$

$(x-3)(x+5) - (x-6)(x+1) = 0$

FOIL $(x^2+2x-15) - (x^2-5x-6) = 0$

$7x - 9 = 0$

$+9 \quad +9$

$\frac{7x}{7} = \frac{9}{7}$ $\boxed{x = \frac{9}{7}}$

53. $\frac{4A}{5b} = x^2 \quad (5b) \Rightarrow \frac{4A}{5x^2} = \frac{5x^2(b)}{5x^2}$ $\boxed{b = \frac{4A}{5x^2}}$

(7.6) 55. $\frac{x}{2} = \frac{12}{4} \Rightarrow \frac{4x}{4} = \frac{24}{4} \Rightarrow \boxed{x = 6}$

57. $\frac{2}{x-1} = \frac{3}{x+3} \Rightarrow 2(x+3) = 3(x-1)$

$2x + 6 = 3x - 3$

$6 = x - 3$

$\boxed{9 = x}$

59. $\frac{300 \text{ parts}}{20 \text{ min}} = \frac{x}{45} \Rightarrow 45(300) = 20x$

$13500 = 20x$

$675 = x$

675 parts

61. $5\left(\frac{1}{x}\right) = \frac{3}{2}\left(\frac{1}{x}\right) + \frac{7}{6}$

$\overset{(6)}{\frac{5}{x}} = \overset{(3)}{\frac{3}{2x}} + \overset{(x)}{\frac{7}{6}}$ LCD = 6x

$30 = 9 + 7x$

$-9 \quad -9$

$21 = 7x$

$\frac{21}{7} = \frac{7x}{7}$

$x = +3$

63. $D = rt$

$Car_1 \Rightarrow 90 = (x)(t) \quad t = \frac{90}{x}$

$Car_2 \Rightarrow 60 = (x-10)(t) \quad t = \frac{60}{x-10}$

$\frac{90}{x} = \frac{60}{x-10}$

$90(x-10) = 60(x)$

$90x - 900 = 60x$

$-900 = -30x$

$30 = x$

Car_1 = 30 mph
Car_2 = 20 mph

65.

Mark	7	$\frac{1}{7}$
Maria	x	$\frac{1}{x}$
Both	5 hrs	$\frac{1}{5}$

$\overset{(5x)}{\frac{1}{7}} + \overset{(35)}{\frac{1}{x}} = \overset{(7x)}{\frac{1}{5}}$ LCD: 35x

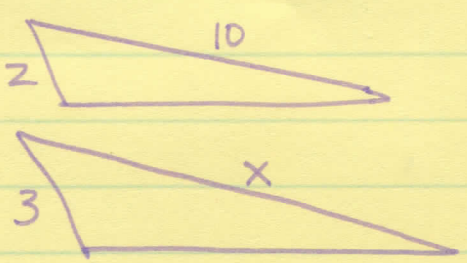
$5x + 35 = 7x$

$35 = 2x$

$17.5 = x$

17 and one half hours when Maria works alone.

67.



$\frac{2}{3} = \frac{10}{x}$

$2(x) = 3(10)$ → $2x = 30$

$x = 15$

(7.7)

69. $\dfrac{\frac{5x}{27}}{\frac{-10xy}{21}} = \dfrac{5x}{27} \cdot \dfrac{21}{-10xy} = \boxed{\dfrac{7}{-18y}}$

71. $\dfrac{y\left(3-\frac{1}{y}\right)}{y\left(2-\frac{1}{y}\right)} = \boxed{\dfrac{3y-1}{2y-1}}$

LCD: y

73. $\dfrac{\frac{x-3}{x+3}+\frac{x+3}{x-3}}{\frac{x-3}{x+3}-\frac{x+3}{x-3}} = \dfrac{\frac{(x-3)(x-3)+(x+3)(x-3)}{(x+3)(x-3)}}{\frac{(x-3)(x-3)-(x+3)(x+3)}{(x+3)(x-3)}}$

LCD: $(x+3)(x-3)$ $= \dfrac{x^2-6x+9+x^2-9}{x^2-6x+9-(x^2+6x+9)} = \dfrac{2x^2-6x}{-12x} \div 2x$

$= \dfrac{2x(x-3)}{2x(-6)} = \boxed{\dfrac{x-3}{-6}}$ or $\boxed{\dfrac{-x+3}{6}}$

75. $\dfrac{(y)\ x+\frac{1}{y}}{\frac{x}{y}} = \boxed{\dfrac{xy+1}{x}}$

LCD: y

Mixed Review

77. $\frac{4x+12}{8x^2+24x} = \frac{4(x+3)}{8x(x+3)} = \frac{4^1}{8x_2} = \boxed{\frac{1}{2x}}$

79. $\frac{x^2+9x+20}{x^2-25} \cdot \frac{x^2-9x+20}{x^2+8x+16}$

$= \frac{(x+4)(x+5)}{(x+5)(x-5)} \cdot \frac{(x-5)(x-4)}{(x+4)(x+4)} = \boxed{\frac{x-4}{x+4}}$

81. $\frac{x}{x^2-36} + \frac{6}{x^2-36} = \frac{x+6}{x^2-36} = \frac{x+6}{(x+6)(x-6)} = \boxed{\frac{1}{x-6}}$

83. $\frac{4(x-2)}{3x^2+8x-3} + \frac{2(x+3)}{3x^2-7x+2}$ LCD: $(3x-1)(x+3)(x-2)$

$3x^2+8x-3$: a·c = 3·−3 = −9; +8; −1; 8b

$(3x^2+9x)(-x-3)$

$3x(x+3)-1(x+3)$

$(3x-1)(x+3)$

$3x^2-7x+2$: a·c = 3·2 = 6; −6; −1; −7b

$(3x^2-6x)(-x+2)$

$3x(x-2)-1(x-2)$

$(3x-1)(x-2)$

$= \frac{4(x-2)+2(x+3)}{(3x-1)(x+3)(x-2)}$

$= \frac{4x-8+2x+6}{(3x-1)(x+3)(x-2)}$

$= \frac{6x-2}{(3x-1)(x+3)(x-2)}$

$= \frac{2(3x-1)}{(3x-1)(x+3)(x-2)}$

$= \boxed{\frac{2}{(x+3)(x-2)}}$

85. $\frac{4}{a-1} + 2^{(a-1)} = \frac{3}{a-1}$ LCD: $(a-1)$

$4 + 2(a-1) = 3$

$4 + 2a - 2 = 3$

$2 + 2a = 3$

$2a = 1$

$\boxed{a = \frac{1}{2}}$

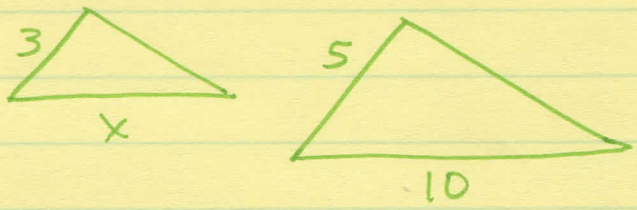
87. $\frac{2x}{3} - \frac{1}{6} = \frac{x}{2}$ LCD: 6

$4x - 1 = 3x$

$-1 = -x$

$\boxed{x = 1}$

The number is one.

89. 

$\frac{3}{x} = \frac{5}{10}$

$3(10) = 5(x)$

$30 = 5x$

$\boxed{6 = x}$

91. $\frac{\frac{1}{4}}{\frac{1}{3} + \frac{1}{2}}$ LCD: 12

$\frac{\frac{3}{12}}{\frac{4}{12} + \frac{6}{12}} = \frac{\frac{3}{12}}{\frac{10}{12}} = \frac{3}{12} \cdot \frac{12}{10} = \boxed{\frac{3}{10}}$

93. $\frac{\frac{1}{y^2}}{1 - \frac{1}{y^2}}$ LCD: y^2

$\frac{\frac{1}{y^2}}{\frac{y^2}{y^2} - \frac{1}{y^2}} = \frac{\frac{1}{y^2}}{\frac{y^2 - 1}{y^2}} = \frac{1}{y^2} \cdot \frac{y^2}{y^2 - 1} = \boxed{\frac{1}{y^2 - 1}}$ OR $\boxed{\frac{1}{(y+1)(y-1)}}$