

4.55)

$$(a) \frac{3}{14} + \frac{5}{7} - \frac{1}{21} = \frac{9}{42} + \frac{30}{42} - \frac{2}{42}$$

$$= \frac{37}{42}$$

$$(b) \frac{\frac{4}{8} \cdot \frac{16}{64}}{\frac{96}{24} \cdot \frac{12}{12}} - \frac{\frac{3}{8} \cdot \frac{63}{84}}{\frac{12}{12} \cdot \frac{4}{4}} = \frac{2}{3} - \frac{3}{4} = \frac{8-9}{12} = -\frac{1}{12}$$

$$(c) \frac{\frac{6}{36} \cdot \frac{1}{44}}{\frac{48}{12} \cdot \frac{6}{6}} \cdot \frac{16}{56} = \frac{\frac{2}{8} \cdot \frac{1}{16}}{\frac{12}{12} \cdot \frac{5}{5}} = \frac{2}{14} = \frac{1}{7}$$

$$(d) \frac{\frac{3}{24} \cdot \frac{1}{14} \cdot 35}{42 \cdot 9 \cdot 28 \cdot 24} = \frac{\frac{1}{8} \cdot 1 \cdot 5}{42 \cdot 1 \cdot 2 \cdot 24} = \frac{5}{96}$$

$$(e) \left(\frac{3}{4}\right)^3 = \frac{27}{64}$$

$$(f) \left(\frac{18}{27}\right)^{-4} = \left(\frac{\frac{3}{27}}{\frac{18}{18}}\right)^4 = \left(\frac{3}{2}\right)^4 = \frac{81}{16}$$

$$(g) 6 \left(\frac{7}{12} - \frac{2}{3} + \frac{1}{4} \right) = 6 \left(\frac{7}{12} - \frac{8}{12} + \frac{3}{12} \right) = 6 \left(\frac{1}{6} \right) = 1$$

$$h) \frac{31 + 71 + 111}{1 + 3 + 5} \cdot \frac{5 + 15 + 25}{111 + 71 + 31} = \frac{5 + 15 + 25}{1 + 3 + 5} = \frac{5(1 + 3 + 5)}{1 + 3 + 5}$$

$$= 5$$

$$(i) \frac{50 - (-3)^3}{\left(\frac{2}{7}\right)^{-1}} = \frac{50 + 27}{\frac{7}{2}} = \frac{(50 + 27) \cdot 2}{7} = \frac{2 \cdot \cancel{7} \cdot 7}{\cancel{7}_1} = 22$$

$$(j) \left(5\frac{1}{3} - 2\frac{1}{4} \right) + \left(5\frac{1}{4} - 3\frac{1}{3} \right)$$

$$= 5 + \frac{1}{3} - 2 - \frac{1}{4} + 5 + \frac{1}{4} - 3 - \frac{1}{3}$$

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

$$= 5$$

$$(k) \left(-1\frac{1}{4} \right)^2 = \left(-\frac{4}{4} - \frac{1}{4} \right)^2 = \left(-\frac{5}{4} \right)^2 = \frac{25}{16}$$

$$= \frac{16}{16} + \frac{9}{16}$$

$$= 1\frac{9}{16}$$

$$(l) 6 \left(11 + \frac{2}{3} + 4 + \frac{1}{2} \right)$$

$$6 \left(15 + \frac{7}{6} \right) = 6 \cdot 15 + 7 = 97$$

4.56)

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

$$= \frac{3 + (-4)(-5) - 9}{-9 + 16} = \frac{3 + 20 - 9}{7}$$

$$= 2$$

$$4.57) \quad \frac{1}{2} \cdot \frac{2}{4} \cdot \frac{1}{8} \cdot \frac{2}{16} \cdot \frac{1}{32} \cdot \frac{2}{64} \cdot \frac{1}{128} \cdot \frac{2}{256}$$

$$2 \cdot 2 \cdot 2 \cdot 2 = 16$$

$$4.58) \quad \frac{1}{8} \cdot \frac{2}{4} \cdot \frac{1}{2} \cdot \frac{2}{4} \cdot \frac{1}{2} \cdot \frac{2}{4} = 4$$

$$4.59) \quad 5 \frac{9}{10} = 5 \text{ horas y } 54 \text{ minutos}$$

$$10:20 \text{ AM} + 5 \text{ horas} + 54 \text{ minutos} = 4:14 \text{ PM}$$

$$4:14 \text{ PM}$$

$$4.60)$$

$$99 \div \frac{101}{102}$$

$$4.61) \quad 2 \frac{1}{3} + 3 \frac{1}{3} + 5 \frac{1}{2} = 10 + \frac{6}{30} + \frac{10}{30} + \frac{15}{30}$$

$$= 10 + \frac{31}{30} = 10 + 1 + \frac{1}{30}$$

$$= 11 \frac{1}{30} \quad 11 \frac{1}{30}$$

$$4.62)$$

$$\frac{2}{2} \times \frac{4}{8} \times \frac{8}{4} \times \dots \times \frac{2012}{2011} = \frac{2012}{2} = 1006$$

$$4.63)$$

$$\frac{\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4}}{\frac{6}{8} \cdot \frac{6}{9} \cdot \frac{1}{2}} = \frac{1 \cdot 2 \cdot 3 \cdot 2 \cdot 3 \cdot 1}{2 \cdot 3 \cdot 4 \cdot 6 \cdot 9 \cdot 1} = 1$$

$$4.64)$$

$$\frac{2}{3} \times \dots \frac{4}{5} \left(\frac{2}{3} \times \right) = \frac{8}{15} \times \frac{15}{15} \times - \frac{6}{15} \times - \frac{8}{15} \times = \frac{2}{15} \times$$

$$\frac{2}{3} \left(\frac{4}{5} \right) = \frac{8}{15}$$

$$\frac{8}{15} + \frac{1}{3} = \frac{5}{15} + \frac{8}{15} \quad \frac{2}{15}$$

$$4.65) \frac{\left(\frac{3}{7}\right)\left(\frac{4}{3}\right)}{7\left(\frac{3}{7}\right) + 3\left(\frac{4}{3}\right)} = \frac{\frac{4}{7}}{7} = \frac{4}{49}$$

$$4.66) (a) \frac{3}{8}, \frac{7}{16}, \frac{13}{32}, \frac{23}{64}$$

$$\frac{24}{64}, \frac{28}{64}, \dots, \frac{23}{64}$$

$$(b) \frac{9}{7}, \frac{5}{4}, \frac{14}{11}$$

$$1. \frac{9 \cdot 4 \cdot 11}{7 \cdot 4 \cdot 11} = \frac{396}{\dots}$$

$$2. \frac{5 \cdot 7 \cdot 11}{7 \cdot 4 \cdot 11} = \frac{385}{\dots}$$

$$3. \frac{14 \cdot 7 \cdot 4}{11 \cdot 7 \cdot 4} = \frac{392}{\dots}$$

$$(c) \frac{199}{400}, \frac{100}{199}, \frac{1}{2}$$

$$\frac{(2) 160}{199} \circ \frac{(1) 100}{200}$$

$$\frac{(1) 199}{400} \circ \frac{(2) 200}{400}$$

$$\frac{1}{2} > \frac{199}{200}$$

$$\frac{100}{199} > \frac{1}{2}$$

$$4.67) \frac{725}{60} \div \frac{25}{6} = \frac{725}{\cancel{60}^{24}_{10}} \cdot \frac{\cancel{6}^1}{25} = \frac{29}{10} = 2\frac{9}{10} \quad 3$$

$$4.68) 2\left(1 - \frac{1}{2}\right) + 3\left(1 - \frac{1}{3}\right) + 4\left(1 - \frac{1}{4}\right) + \dots + 10\left(1 - \frac{1}{10}\right)$$

$$2 - 1 + 3 - 1 + 4 - 1 + \dots + 10 - 1$$

$$2 + 3 + \dots + 10 - 9 = 48 + 6 - 9$$

$$= 45$$

4.69)

$$3\frac{1}{4} \cdot \frac{1}{2} = \left(3 + \frac{1}{4}\right) \cdot \frac{1}{2} = \frac{3}{2} + \frac{1}{8}$$

$$= \frac{12}{8} + \frac{1}{8} = \frac{13}{8} \text{ libras}$$

$$\frac{13}{8} - \frac{2}{8} = \frac{11}{8} = 1\frac{3}{8}$$

4.70)

$$\frac{1}{a} > \frac{1}{6}$$

$a < 6$ y a es entero

a puede ser 1, 2, 3, 4 y 5.

$$\frac{1}{1}, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}$$

4.71)

$$\frac{3}{19} \cdot 95 - \frac{3}{19} \cdot 57 = \frac{3}{19} (95 - 57) = \frac{3}{19} (38)$$

$$= 6$$

4.72)

$$\frac{15}{42} \left(-\frac{63}{55}\right) \left(\frac{3}{2}\right)^{-2} \left(\frac{11}{2}\right)^2$$

$$\frac{15}{42} \cdot \left(-\frac{63}{55}\right) \left(\frac{2^2}{3 \cdot 3}\right) \left(\frac{11 \cdot 11}{2^2}\right) = \frac{1}{42} \cdot \left(-\frac{63}{5}\right) \left(\frac{1}{3}\right) (11)$$

$$= -\frac{11}{2} \quad -\frac{11}{2}$$

4.73)

$$\frac{2}{8} (400) = 100. \quad \frac{1}{4} (160) = 40$$

4.74)

$$\frac{9}{5} \left(3\frac{1}{3} \cdot \frac{1}{2} \cdot \frac{1}{2} - \frac{10}{12} \cdot \frac{1}{2} \cdot \frac{1}{4}\right)$$

$$\frac{9}{5} \cdot \frac{1}{2} \left(3\frac{1}{3} \cdot \frac{1}{2} - \frac{10}{12} \cdot \frac{1}{2}\right) = \frac{9}{10} \left(\left(\frac{9}{3} + \frac{1}{3}\right) \cdot \frac{1}{2} - \frac{5}{24}\right)$$

$$= \frac{9}{10} \left(\frac{40}{24} - \frac{5}{24}\right) = \frac{9}{10} \left(\frac{35}{24}\right) = \frac{9}{10} \left(\frac{5}{3} - \frac{5}{24}\right)$$

$$= \frac{21}{16}$$

$$4.75) \frac{7}{19} \cdot \frac{13}{44} + \frac{7}{19} \cdot \frac{19}{44} + \frac{7}{19} \cdot \frac{25}{44} + \frac{7}{19} \cdot \frac{31}{44}$$

$$\frac{7}{19} \left(\frac{13}{44} + \frac{19}{44} + \frac{25}{44} + \frac{31}{44} \right) = \frac{7}{19} \left(\frac{88}{44} \right) = \frac{14}{19}$$

$$4.76) 99 \cdot 2\frac{1}{49} \quad \text{ó} \quad 200$$

$$99 \left(2 + \frac{1}{49} \right) = 198 + \frac{99}{49} \quad 99 \cdot 2\frac{1}{49} \text{ es más grande.}$$

$$= 198 + \frac{98}{49} + \frac{1}{49} = 200 + \frac{1}{49}$$

4.77)

$$\frac{1}{2} + \frac{1}{6} + \frac{1}{6} = 1 \quad \frac{1}{2}, \frac{1}{3}, \frac{1}{6}.$$

2, 3, 6

$1 = \frac{1}{3} + \frac{1}{3} + \frac{1}{3}$. Pero necesito 3 recíprocos diferentes, por lo que 1 debe ser mayor a $\frac{1}{3}$. ($\frac{1}{2}$)

Ahora tengo $\frac{1}{2}$. Necesito otro $\frac{1}{2}$:

$$\frac{1}{2} = \frac{1}{4} + \frac{1}{4}, \text{ por lo que necesito un recíproco mayor a } \frac{1}{4}. \text{ El único es } \frac{1}{3}.$$

4.78)

$$\begin{aligned} 12\frac{2}{3} \cdot (300) &= \left(12 + \frac{2}{3} \right) 300 = 300 \cdot 12 + 2 \cdot 100 \\ &= 100 \cdot 2 (3 \cdot 6 + 1) \\ &= 200 (14) = 3800 \end{aligned}$$

3800 pies de tubo.

4.79)

$$\frac{1}{5} + \frac{1}{7} = \frac{1}{x}$$

$$\frac{7+5}{35} = \frac{12}{35}$$

$$\frac{35}{12} = \frac{24}{12} + \frac{11}{12}$$

$$= 2\frac{11}{12} \quad 2\frac{11}{12}$$