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) $\frac{64}{96} - \frac{63}{84} = \frac{2}{3} - \frac{3}{4} = \frac{8-9}{12} = -\frac{1}{12}$

(c) $\frac{36}{48} \cdot \frac{44}{66} \cdot \frac{16}{56} = \frac{6 \cdot 16}{12 \cdot 56} = \frac{2}{14} = \frac{1}{7}$

(d) $\frac{27 \cdot 14 \cdot 35}{42 \cdot 9 \cdot 28 \cdot 24} = \frac{3 \cdot 1 \cdot 35}{42 \cdot 1 \cdot 2 \cdot 24} = \frac{5}{96}$

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

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

(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) $\frac{50-(-3)^3}{\left(\frac{2}{7}\right)^{-1}} = \frac{50+27}{\frac{7}{2}} = \frac{(50+27)\,2}{7} = \frac{2 \cdot \overset{11}{\cancel{77}}}{\underset{1}{\cancel{7}}} = 22$

(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)

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

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

$= 2$

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

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

4.58) $\frac{1}{6} \cdot \frac{x}{7} \cdot \frac{1}{22} \cdot 168 = 4$

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

10:20 AM + 5horas + 54 minutos = 4:14 PM

4:14 PM

4.60)

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

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

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

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

4.62) $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \cdots \times \frac{2012}{2011} = \frac{2012}{2} = 1006$

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

4.64)

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

$\frac{2}{3}\left(\frac{4}{5} = \frac{8}{15}\right.$ $\frac{8}{15} + \frac{1}{3} = \frac{5}{15} + \frac{8}{15}$ $\frac{2}{15}$

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

4.66)

(a) $\dfrac{3}{8}, \dfrac{7}{16}, -\dfrac{13}{32}, \dfrac{23}{64}$ (3, 4, 1, 2)

$\dfrac{24}{64}, \dfrac{28}{64}, \cdots, \dfrac{23}{64}$.

(b) $\dfrac{9}{7}, \dfrac{5}{4}, \dfrac{14}{11}$ (3, 1, 2)

1. $\dfrac{9\cdot4\cdot11}{7\cdot4\cdot11} = \dfrac{396}{\cdots}$

2. $\dfrac{5\cdot7\cdot11}{7\cdot4\cdot11} = \dfrac{385}{\cdots}$

3. $\dfrac{14\cdot7\cdot4}{11\cdot7\cdot4} = \dfrac{392}{\cdots}$

(c) $\dfrac{199}{400}, \dfrac{100}{199}, \dfrac{1}{2}$ (1, 3, 2)

$\dfrac{160}{199}$ (2) ○ $\dfrac{100}{200}$ (1)

$\dfrac{199}{400}$ (1) ○ $\dfrac{200}{400}$ (2)

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

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

4.67) $\dfrac{725}{60} \div \dfrac{25}{6} = \dfrac{\overset{29}{\cancel{725}}}{\underset{10}{\cancel{60}}} \cdot \dfrac{\cancel{6}^{1}}{\cancel{25}_{1}} = \dfrac{29}{10} = 2\dfrac{9}{10}$ 3

4.68)

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

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

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

$= 45$

4.69)

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

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

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

4.70)

$$\frac{1}{a} > \frac{1}{6} \qquad a < 6 \quad \text{y } a \text{ es entero}$$

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)

$$\frac{3}{19}\cdot 95 - \frac{3}{19}\cdot 57 = \frac{3}{19}(95-57) = \frac{3}{\cancel{19}_{1}}\left(\cancel{38}^{2}\right)$$

$$= 6$$

4.72)

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

$$\frac{\cancel{15}^{5}}{42}\cdot\left(-\frac{63}{\cancel{55}_{11}}\right)\left(\frac{\cancel{2}^{1}\cdot\cancel{2}^{1}}{\cancel{3}\cdot 3}\right)\left(\frac{\cancel{11}^{1}\cdot 11}{\cancel{2}^{1}\cdot\cancel{2}^{1}}\right) = \frac{1}{\cancel{42}_{2}}\cdot\left(-\frac{\cancel{63}^{21}}{3}\right)\left(\frac{1}{\cancel{2}_{1}}\right)(11)$$

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

4.73)

$$\frac{2}{\cancel{8}_{1}}\left(\cancel{400}^{80}\right) = 160. \qquad \frac{1}{\cancel{4}_{1}}\left(\cancel{160}^{40}\right) = 40$$

4.74)

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

$$\frac{9}{5}\cdot\frac{1}{2}\left(3\frac{1}{3}\cdot\frac{1}{2} - \frac{\cancel{10}^{5}}{12}\cdot\frac{1}{\cancel{4}_{2}}\right) = \frac{9}{10}\left(\left(\frac{9}{3}+\frac{1}{3}\right)\cdot\frac{1}{2} - \frac{5}{24}\right)$$

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

$$= \frac{9}{10}\left(\frac{40}{24} - \frac{5}{24}\right) = \frac{\cancel{9}^{3}}{\cancel{10}_{2}}\left(\frac{\cancel{35}^{7}}{\cancel{24}_{8}}\right)$$

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

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) $99\cdot 2\frac{1}{99}$ o 200

$$99\left(2+\frac{1}{44}\right)=198+\frac{99}{99}$$

$99\cdot 2\frac{1}{99}$ es más grande.

$$=198+\frac{98}{99}+\frac{1}{99}=200+\frac{1}{99}$$

4.77) $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=1$ $\quad \frac{1}{2},\frac{1}{3},\frac{1}{6}.$

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 $\frac{1}{3}$. $\left(\frac{1}{2}\right)$

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

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

El único es $\frac{1}{3}$.

4.78) $12\frac{2}{3}\cdot(300)=\left(12+\frac{2}{3}\right)300=300\cdot 12+2\cdot 100$

$$=100\cdot 2\left(3\cdot 6+1\right)$$

$$=200\,(19)=3800$$

3800 pies de tubo.

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

$$\frac{7+5}{35}=\frac{12}{35}\qquad \frac{35}{12}=\frac{24}{12}+\frac{11}{12}$$

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