

$$1) a) \frac{40}{30} = \frac{4}{3} = \frac{4}{12} = \frac{5}{15} \quad b) \frac{180}{120} = \frac{18}{12} = \frac{6}{4} = \frac{3}{2}$$

$$c) \frac{50}{100000} = \frac{5}{1000} = 0,0005 \quad d) -\frac{5}{3} = -\frac{50}{30}$$

$$2) \frac{25}{16} \text{ y } \frac{5}{4} \quad 25 \cdot 4 = 100 \quad 16 \cdot 5 = 80 \quad \text{No son equivalentes.}$$

$$3) \frac{1404}{900} = \frac{351}{225} = \frac{39}{25}$$

$$4) \frac{1}{5}, \frac{3}{4}, \frac{2}{7}, \frac{9}{8}, \frac{6}{5}, \frac{5}{6} \quad \begin{array}{l} 5=5 \\ 4=2^2 \\ 7=7 \end{array} \quad \begin{array}{l} 8=2^3 \\ 6=2 \cdot 3 \end{array}$$

$$\text{m.c.m.}(4,5,7,8,6) = 2^3 \cdot 3 \cdot 5 \cdot 7 = 840$$

$$\frac{1}{5} = \frac{168}{840}$$

$$\frac{3}{4} = \frac{630}{840}$$

$$\frac{2}{7} = \frac{240}{840}$$

$$\frac{9}{8} = \frac{945}{840}$$

$$\frac{6}{5} = \frac{1008}{840}$$

$$\frac{5}{6} = \frac{700}{840}$$

$$\frac{6}{5} > \frac{9}{8} > \frac{5}{6} > \frac{3}{4} > \frac{2}{7} > \frac{1}{5}$$

$$5) a) -2 + \left(-\frac{5}{6}\right) - \left(-\frac{1}{4}\right) = -\frac{24}{12} - \frac{10}{12} + \frac{3}{12} = -\frac{31}{12}$$

$$b) \frac{4}{5} \cdot \left(-\frac{7}{3}\right) \div 3 = -\frac{28}{15} \div 3 = -\frac{28}{45}$$

$$c) \frac{1}{2} - \frac{5}{3} \div \left(-\frac{2}{7}\right) = \frac{1}{2} + \frac{35}{6} = \frac{3}{6} + \frac{35}{6} = \frac{38}{6} = \frac{19}{3}$$

$$d) 2 - \frac{1}{3} \cdot \left(1 - \frac{1}{4}\right) + \frac{3}{2} \div 3 = 2 - \frac{1}{3} \cdot \left(\frac{4}{4} - \frac{1}{4}\right) + \frac{3}{6} =$$

$$= 2 - \frac{1}{3} \cdot \frac{3}{4} + \frac{1}{2} = 2 - \frac{3}{12} + \frac{1}{2} = 2 - \frac{1}{4} + \frac{1}{2} = \frac{8}{4} - \frac{1}{4} + \frac{2}{4}$$

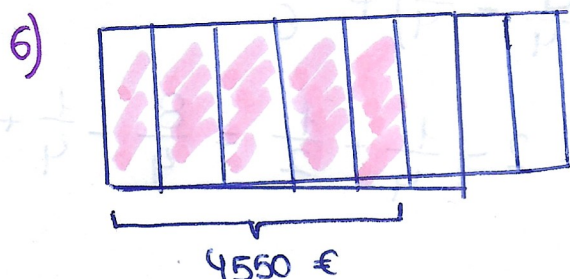
$$= \frac{9}{4}$$

$$e) \left(\frac{5}{2} - \frac{5}{6} + \frac{2}{3} - \frac{1}{4} \right) \div \left[2 - \frac{1}{2} \cdot \left(1 + \frac{5}{3} \right) \right] = \left(\frac{30}{12} - \frac{10}{12} + \frac{8}{12} - \frac{3}{12} \right) \div \left[2 - \frac{1}{2} \cdot \left(\frac{3}{3} + \frac{5}{3} \right) \right] = \frac{25}{12} \div \left[2 - \frac{1}{2} \cdot \frac{8}{3} \right] = \frac{25}{12} \div \left(2 - \frac{8}{6} \right) = \frac{25}{12} \div \left(2 - \frac{4}{3} \right) = \frac{25}{12} \div \left(\frac{6}{3} - \frac{4}{3} \right) = \frac{25}{12} \div \frac{2}{3} = \frac{75}{24} = \frac{25}{8}$$

$$f) \left(\frac{1}{9} - \frac{7}{6} \right) \cdot \left(\frac{6}{5} - \frac{3}{10} \right) \div \left(\frac{1}{2} - \frac{3}{4} \right) = \left(\frac{2}{18} - \frac{21}{18} \right) \cdot \left(\frac{12}{10} - \frac{3}{10} \right) \div \left(\frac{2}{4} - \frac{3}{4} \right) = \left(\frac{-19}{18} \right) \cdot \left(\frac{9}{10} \right) \div \left(\frac{-1}{4} \right) = \frac{-19 \cdot 9}{18 \cdot 10} \div \left(\frac{-1}{4} \right) = \frac{-19}{20} \div \left(\frac{-1}{4} \right) = \frac{19 \cdot 4}{20 \cdot 1} = \frac{19}{5}$$

$$g) \frac{3}{4} \cdot \left(\frac{2}{5} - \frac{3}{15} \right) + 2 \div \frac{4}{3} - \frac{1}{2} = \frac{3}{4} \cdot \left(\frac{6}{15} - \frac{3}{15} \right) + \frac{6}{4} - \frac{1}{2} = \frac{3}{4} \cdot \frac{3}{15} + \frac{3}{2} - \frac{1}{2} = \frac{3 \cdot 3}{4 \cdot 15} + \frac{3}{2} - \frac{1}{2} = \frac{3}{20} + \frac{3}{2} - \frac{1}{2} = \frac{3}{20} + \frac{30}{20} - \frac{10}{20} = \frac{23}{20}$$

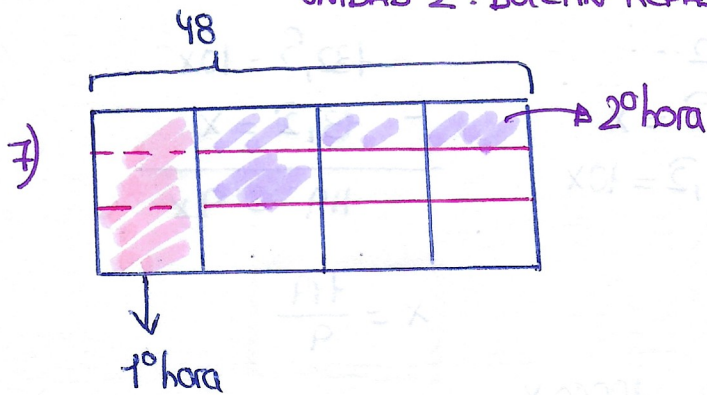
$$h) \left(\frac{9}{4} - \frac{5}{12} + \frac{1}{6} \right)^2 \div \left(\frac{3}{4} \cdot \frac{10}{5} \right)^3 = \left(\frac{27}{12} - \frac{5}{12} + \frac{2}{12} \right)^2 \div \left(\frac{3 \cdot 10}{4 \cdot 5} \right)^3 = \left(\frac{24}{12} \right)^2 \div \left(\frac{3}{2} \right)^3 = \left(\frac{2}{1} \right)^2 \div \frac{27}{8} = \frac{4}{1} \div \frac{27}{8} = \frac{32}{27}$$



$$4550 \div 5 = 910 \text{ € cada trozo}$$

$$910 \cdot 8 = 7280 \text{ €}$$

Debe ahorrar 7280 €



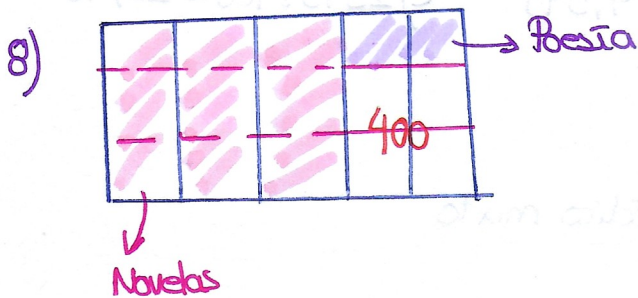
En las dos primeras horas ha recorrido $\frac{7}{12}$

Faltan $\frac{5}{12}$

$$48 : 12 = 4 \text{ cada cuadrado}$$

$$4 \cdot 5 = 20 \text{ km}$$

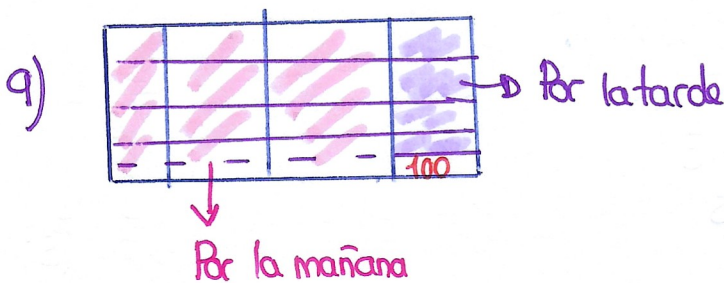
Faltan 20 km del recorrido



$$400 : 4 = 100 \text{ cada cuadrado}$$

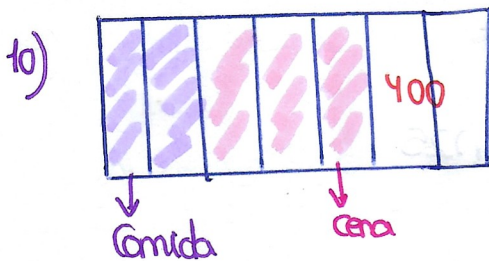
$$100 \cdot 15 = 1500$$

En la biblioteca hay 1500 libros.



$$100 \cdot 20 = 2000 \text{ kg}$$

Tenía 2000 kg



$$400 : 2 = 200 \text{ gramos cada trozo}$$

$$200 \cdot 7 = 1400 \text{ gramos}$$

La pieza pesaba 1400 g.

11) Decimal exacto - 1,47

Decimal periódico puro $1,7\overline{5}$

Decimal periódico mixto - $3,2\overline{7}$

Irracional π

$$12) a) 4,23 = \frac{423}{100}$$

$$b) 13,22 \dots$$

$$13,2 = x$$

$$132,2 = 10x$$

$$132,2 = 10x$$

$$- 13,2 = x$$

$$119 = 9x$$

$$x = \frac{119}{9}$$

$$c) 0,563838 \dots$$

$$0,56\overline{38} = x$$

$$56,3\overline{8} = 100x$$

$$5638,3\overline{8} = 10000x$$

$$5638,3\overline{8} = 10000x$$

$$- 56,3\overline{8} = 100x$$

$$5582 = 9900x$$

$$x = \frac{5582}{9900} = \frac{2791}{4950}$$

$$13) a) 0,0097 \cdot 100 = 0,97$$

$$b) 0,45 \cdot 10 = 4,5$$

$$c) 2345 : 100 = 23,45$$

$$d) 0,39 : 10 = 0,039$$

$$14) a) F. \quad 6,0\overline{5} \text{ es un decimal peri6dico mixto}$$

$$b) V.$$

$$\begin{array}{r} 89 \\ 390 \overline{) 50} \\ \underline{390} \end{array}$$

$$c) V.$$

$$\begin{array}{r} 196 \\ 690 \overline{) 135} \\ \underline{690} \end{array}$$

$$d) F.$$

$$\begin{array}{r} 25 \\ 10 \overline{) 25} \\ \underline{20} \end{array}$$

$$\frac{25}{8} = 3,125$$

$$e) V.$$

$$\begin{array}{r} 23 \\ 430 \overline{) 90} \\ \underline{430} \end{array}$$

- 15) 3500 dosis
 1,96 kg de principio activo
 " "
 1960 g de principio activo

$$\frac{1960}{2100} = \frac{13500}{0,56}$$

Cada dosis lleva 0,56 g de principio activo

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

b) $(5)^{-3} = \left(\frac{1}{5}\right)^3 = \frac{1}{125}$

c) $\left(-\frac{6}{8}\right)^{-2} = \left(-\frac{8}{6}\right)^2 = \frac{64}{36} = \frac{16}{9}$

d) $\left(\frac{-1}{2}\right)^{-3} = \left(\frac{-2}{1}\right)^3 = -8$

e) $\left(\frac{3}{30}\right)^{-5} = \left(\frac{1}{10}\right)^{-5} = \left(\frac{10}{1}\right)^5 = 100000$

17) a) $a^{-3} = \left(\frac{1}{a}\right)^3$

b) $\frac{1}{a^{-3}} = a^3$

c) $\left(\frac{a}{b}\right)^{-3} = \left(\frac{b}{a}\right)^3$

d) $\left(\frac{a}{b}\right)^0 = 1$

e) $\frac{1}{(-a)^{-3}} = (-a)^3$

18) a) $\left(\frac{1}{2}\right)^6 \div \left[\left(\frac{1}{2}\right)^{-3}\right]^{-4} = \left(\frac{1}{2}\right)^6 \div \left(\frac{1}{2}\right)^{12} = \left(\frac{1}{2}\right)^{-6} = 2^6$

b) $\left(\frac{a}{b}\right)^5 \cdot \left(\frac{a}{b}\right)^{-2} \div \left(\frac{b}{a}\right)^{-3} = \left(\frac{a}{b}\right)^3 \div \left(\frac{a}{b}\right)^3 = \left(\frac{a}{b}\right)^0 = 1$

c) $\frac{(-3)^6 \cdot (-4)^6}{2^6} = \frac{(12)^6}{2^6} = 6^6$

d) $\frac{6^3}{6^7} = 6^{-4} = \left(\frac{1}{6}\right)^4$

e) $(5^3)^4 \cdot 5^{-9} \cdot 5^{-3} = 5^{12} \cdot 5^{-9} \cdot 5^{-3} = 5^3 \cdot 5^{-3} = 5^0 = 1$

f) $\left[\left(\frac{4}{5}\right)^2 \cdot \left(\frac{4}{5}\right)^{-2}\right]^2 \cdot \left(-\frac{4}{5}\right)^{-6} = \left[\left(\frac{4}{5}\right)^4\right]^2 \cdot \left(\frac{4}{5}\right)^{-6} = \left(\frac{4}{5}\right)^8 \cdot \left(\frac{4}{5}\right)^{-6} = \left(\frac{4}{5}\right)^2$

g) $(-3)^4 \cdot (-3)^6 \div (-3)^5 = (-3)^{10} \div (-3)^5 = (-3)^5$

h) $4^{-3} \cdot 4^{-7} = 4^{-10} = \left(\frac{1}{4}\right)^{10}$