

NUMBERS 2

1) Work out and simplify:

(2.25 p)

a) $\frac{-3}{2} \times \left(\frac{1}{3} - 2 + \frac{3}{2} \right) - \left(\frac{1}{2} \right)^2 =$

b) $(-2)^3 - \frac{4 - 2 \times (-3)}{2} =$

c) $\left(2 - \frac{3}{5} + \frac{2}{15} \right) \div \left(\frac{3}{2} - \frac{7}{10} \right) =$

 2) Elisabeth buys $\frac{2}{3}$ of a pound of grapes and $\frac{5}{7}$ pounds of oranges. Does she buy more grapes or more oranges? How many pounds of fruit does she buy in total?

(1.25 p)

3) Write each of the following expressions as a single positive power: (1.5 p)

a) $\left(\frac{2}{3} \right)^{-2} \div \frac{9}{2} =$

b) $\frac{5^{-2} \times 10^4 \times (4^2)^3}{(5^2)^2 \times 2^{-2} \times 4^3} =$

4) Complete:

(2 p)

Number	to 3 s.f.	to 2 s.f.	to 1 s.f.
0.07859			
4273			
3.207			
31006			

 5) Wood loses $\frac{2}{9}$ of its weight when it dries. We bought 27000 kg of green wood at 1.25 euros per kilo. When it dried, we sold it at 1.75 per kilo. How much have we earned?

(1.5 p)



6) Ordena de menor a mayor los siguientes números decimales, clasifícalos (racional o irracional) y deduce su expresión en forma de fracción (si se puede): (1.5 p)

 1.060060006...; $1.0\overline{6}$; 1.06; 1.0606; $1.0\overline{06}$

SOLUTIONS

1) Work out and simplify:

$$a) \frac{-3}{2} \times \left(\frac{1}{3} - 2 + \frac{3}{2} \right) - \left(\frac{1}{2} \right)^2 = \frac{-3}{2} \times \left(\frac{2-12+9}{6} \right) - \frac{1}{4} = \frac{-3 \times (-1)}{12} - \frac{1}{4} = \frac{1}{4} - \frac{1}{4} = 0$$

$$b) (-2)^3 - \frac{4-2 \times (-3)}{2} = -8 - \frac{4+6}{2} = -8 - 5 = -13$$

$$c) \left(2 - \frac{3}{5} + \frac{2}{15} \right) \div \left(\frac{3}{2} - \frac{7}{10} \right) = \left(\frac{30-9+2}{15} \right) \div \left(\frac{15-7}{10} \right) = \frac{23}{15} \div \frac{8}{10} = \frac{23 \times 10}{15 \times 8} = \frac{23}{12}$$

2) Elisabeth buys $\frac{2}{3}$ of a pound of grapes and $\frac{5}{7}$ of a pound of oranges. Does she buy more grapes or more oranges? How many pounds of fruit does she buy in total?

$$\frac{2}{3}, \frac{5}{7} \rightarrow \frac{14}{21}, \frac{15}{21} \rightarrow \frac{5}{7} > \frac{2}{3} \text{ she buys more oranges}$$

$$\frac{2}{3} + \frac{5}{7} = \frac{14}{21} + \frac{15}{21} = \frac{29}{21} = 1 \frac{8}{21} \text{ She buys } \frac{29}{21} \text{ lbs of fruit in total}$$

3) Write each of the following expressions as a single positive power:

$$a) \left(\frac{2}{3} \right)^{-2} \div \frac{9}{2} = \frac{3^2}{2^2} \div \frac{3^2}{2} = \frac{3^2 \times 2}{3^2 \times 2^2} = \frac{1}{2}$$

$$b) \frac{5^{-2} \times 10^4 \times (4^2)^3}{(5^2)^2 \times 2^{-2} \times 4^3} = \frac{5^{-2} \times 2^4 \times 5^4 \times 2^{12}}{5^4 \times 2^{-2} \times 2^6} = \frac{5^2 \times 2^{16}}{5^4 \times 2^4} = \frac{2^{12}}{5^2}$$

4) Complete:

Number	to 3 s.f.	to 2 s.f.	to 1 s.f.
0.07859	0.0786	0.079	0.08
4273	4270	4300	4000
3.207	3.21	3.2	3
31006	31000	31000	30000

5) Wood loses $\frac{2}{9}$ of its weight when it dries. We bought 27000 kg of green wood at 1.25 euros per kilo. When it dried, we sold it at 1.75 per kilo. How much have we earned?

$$\frac{7}{9} \text{ of } 27000 = \frac{7 \times 27000}{9} = 21000 \text{ kg we have when it dries}$$

We have paid $1.25 \times 27000 = 33750$ euros

We have bought it for $1.75 \times 21000 = 36750$ euros

We have earned $36750 - 33750 = 3000$ euros



6) Ordena de menor a mayor los siguientes números decimales, clasifícalos (racional o irracional) y deduce su expresión en forma de fracción (si se puede): (1.5 p)

$1.060060006\dots$; $1.0\widehat{6}$; $1.0\overline{6}$; $1.060\overline{6}$; $1.0\overline{6}$

De menor a mayor:

$$1.06 < 1.060060006\dots < 1.060\overline{6} < 1.0\overline{6} < 1.0\widehat{6}$$

Irracional sólo es $1.060060006\dots$

1.06 y $1.060\overline{6}$ son racionales, decimales exactos

$1.0\overline{6}$ es racional, decimal periódico puro

$1.0\widehat{6}$ es racional, decimal periódico mixto

En forma de fracción:

$$1.06 = \frac{106}{100} = \frac{53}{50}$$

$$1.060\overline{6} = \frac{10606}{10000} = \frac{5303}{5000}$$

$$\left. \begin{array}{l} N = 1.0\overline{6} = 1.060606\dots \\ 100N = 106.060606\dots \end{array} \right\} \rightarrow \text{restando } 99N = 105 \rightarrow N = \frac{105}{99} \rightarrow 1.0\overline{6} = \frac{35}{33}$$

$$\left. \begin{array}{l} N = 1.0\widehat{6} = 1.06666\dots \\ 100N = 106.666\dots \\ 10N = 10.66666\dots \end{array} \right\} \rightarrow \text{restando } 90N = 96 \rightarrow N = \frac{96}{90} \rightarrow 1.0\widehat{6} = \frac{16}{15}$$