IES MURILLO

Maths 3rd ESO

EXAM 1_1 (Numbers)

1) Mark on the real number line the following: (1.5 points)

$$-\frac{2}{3};\quad -4;\quad \frac{8}{5};\quad \frac{7}{4}$$

2) Work out and simplify: (3 points)

a) $2\cdot 3-4\cdot[5-5(2-3)]-3\cdot(-10)=$

b) $\dfrac{-2\cdot(1-5)+3\cdot 4-4}{2^2-5\cdot(3-3)}=$

c) $-2-3\cdot\left[\dfrac{4}{5}-24\cdot\left(\dfrac{-1}{2}\right)^3\right]=$

d) $\left(\dfrac{2}{3}-1\right)\div\dfrac{1}{6}+\dfrac{5}{2}\cdot\dfrac{3}{20}-\dfrac{3}{20}=$

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

a) $\dfrac{5^5\cdot 5^4\cdot 5^{-2}}{\left(5^2\right)^3}=$

b) $\dfrac{a^3\cdot\left(a^2\right)^{-2}}{a^{-2}\cdot\left(a^{-1}\right)^3}=$

c) $\left(\dfrac{2}{9}\right)^{-3}\div\left(\dfrac{3}{2}\right)^3=$

d) $\dfrac{4^2\cdot 6^4\cdot 3^{-2}}{12^3}=$

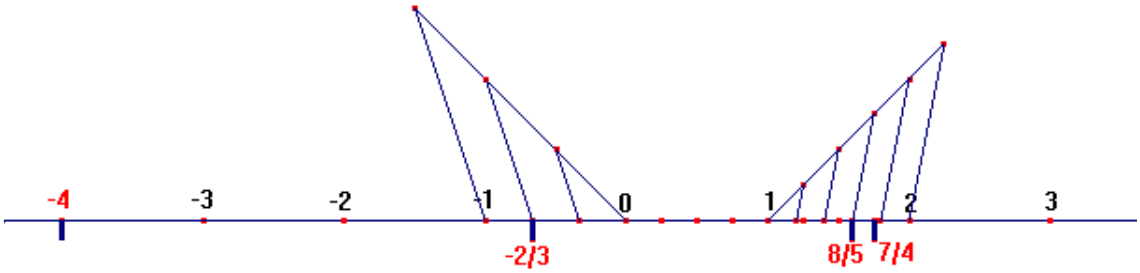
4. The Floop family went to a hockey game last weekend. They spent $12 on food, $34 on souvenirs, and $14 on drinks. What fraction of their expenditures was spent on drinks? (1.25 points)

5. Four friends bought a present. The first one gave 1/5 of the total; the second one paid 1/3 of the remainder; the third one contributed with 1/4 of the remainder and the fourth one had to pay 12 euros. How much was the present and how much did each friend pay? (1.25 points)

SOLUTION

1) Mark on the real number line the following:

$-\frac{2}{3}$; -4; $\frac{8}{5}$; $\frac{7}{4}$



2) Work out and simplify:

a) $2\cdot 3-4\cdot[5-5(2-3)]-3\cdot(-10)=6-4\cdot[5-5\cdot(-1)]+30=$
$=6-4\cdot[5+5]+30=6-40+30=-4$

b) $\frac{-2\cdot(1-5)+3\cdot 4-4}{2^2-5\cdot(3-3)}=\frac{-2\cdot(-4)+12-4}{4-5\cdot 0}=\frac{8+12-4}{4}=4$

c) $-2-3\cdot\left[\frac{4}{5}-24\cdot\left(\frac{-1}{2}\right)^3\right]=-2-3\cdot\left[\frac{4}{5}+\frac{24}{8}\right]=-2-3\cdot\left[\frac{4}{5}+3\right]=$
$=-2-3\cdot\left[\frac{4}{5}+\frac{15}{5}\right]=-2-3\cdot\left[\frac{19}{5}\right]=-2-\frac{57}{5}=-\frac{67}{5}$

d) $\left(\frac{2}{3}-1\right)\div\frac{1}{6}+\frac{5}{2}\cdot\frac{3}{20}-\frac{3}{20}=\left(\frac{2-3}{3}\right)\div\frac{1}{6}+\frac{3}{8}-\frac{3}{20}=$
$=-\frac{1}{3}\div\frac{1}{6}+\frac{3}{8}-\frac{3}{20}=-\frac{2}{1}+\frac{3}{8}-\frac{3}{20}=\frac{-80+15-6}{40}=-\frac{71}{40}$

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

a) $\frac{5^5\cdot 5^4\cdot 5^{-2}}{(5^2)^3}=\frac{5^{5+4-2}}{5^6}=\frac{5^7}{5^6}=5$

b) $\frac{a^3\cdot(a^2)^{-2}}{a^{-2}\cdot(a^{-1})^3}=\frac{a^3\cdot a^{-4}}{a^{-2}\cdot a^{-3}}=\frac{a^{-1}}{a^{-5}}=\frac{a^5}{a^1}=a^4$

c) $\left(\frac{2}{9}\right)^{-3}\div\left(\frac{3}{2}\right)^3=\left(\frac{9}{2}\right)^3\div\left(\frac{3}{2}\right)^3=\frac{3^6}{2^3}\div\frac{3^3}{2^3}=\frac{3^6\cdot 2^3}{2^3\cdot 3^3}=3^3$

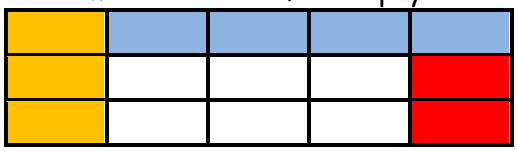
d) $\frac{4^2\cdot 6^4\cdot 3^{-2}}{12^3}=\frac{2^4\cdot 2^4\cdot 3^4\cdot 3^{-2}}{3^3\cdot 2^6}=\frac{2^8\cdot 3^2}{3^3\cdot 2^6}=\frac{2^2}{3}$

4. The Floop family went to a hockey game last weekend. They spent $12 on food, $34 on souvenirs, and $14 on drinks. What fraction of their expenditures was spent on drinks?

$12 + 34 + 14 = 60$ the total is €60

On drinks they spent $\frac{14}{60} = \frac{7}{30}$ of their expenditures

5. Four friends bought a present. The first one gave 1/5 of the total; the second one paid 1/3 of the remainder; the third one contributed with 1/4 of the remainder and the fourth one had to pay 12 euros. How much was the present and how much did each friend pay?



1/3

12: 6 = €2 each little square

2 x 15 = €30 was the total

1/5 1/4

The first friend paid 3x 2 = €6

The second one paid 4 x 2 = € 8

The third one paid 2 x 2 = €4

The fourth one paid €12