CONTROLE DE MATHEMATIQUES
Calcul en écriture fractionnaire
Jeudi 10 novembre 2011

Corrigé

EXERCICE N°1

a	Opposé de a	Inverse de a
-4	4	$-\frac{1}{4}$
$\frac{3}{4}$	$-\frac{3}{4}$	$\frac{4}{3}$

EXERCICE N°2 (13 points)

$$A = 1-\frac{1}{4}+\frac{3}{7}-\frac{5}{4}-\frac{2}{7}$$
$$= 1+\frac{-1}{4}+\frac{3}{7}+\frac{-5}{4}+\frac{-2}{7}$$
$$= 1+\frac{-1}{4}+\frac{-5}{4}+\frac{3}{7}+\frac{-2}{7}$$
$$= 1+\frac{-1+(-5)}{4}+\frac{3+(-2)}{7}$$
$$= 1+\frac{-6}{4}+\frac{1}{7}$$
$$= 1+\frac{-3}{2}+\frac{1}{7}$$
$$= \frac{14}{14}+\frac{-3\times 7}{2\times 7}+\frac{1\times 2}{7\times 2}$$
$$= \frac{14-21+2}{14}$$
$$= \frac{-5}{14}$$
$$= \boxed{-\frac{5}{14}}$$

$$B = \frac{3+\frac{1}{5}}{3-\frac{1}{5}}$$
$$= \frac{\frac{3\times 5}{5}+\frac{1}{5}}{\frac{3\times 5}{5}-\frac{1}{5}}$$
$$= \frac{\frac{15}{5}+\frac{1}{5}}{\frac{15}{5}-\frac{1}{5}}$$
$$= \frac{\frac{15+1}{5}}{\frac{15-1}{5}}$$
$$= \frac{\frac{16}{5}}{\frac{14}{5}}$$
$$= \frac{16}{5}\times\frac{5}{14}$$
$$= \frac{2\times 8\times 5}{5\times 2\times 7}$$
$$= \boxed{\frac{8}{7}}$$

$$C = \frac{1}{4}+\frac{7}{3}\times\left(-\frac{2}{5}\right)-\frac{5}{4}\times\frac{1}{3}$$
$$= \frac{1}{4}+\frac{7}{3}\times\frac{-2}{5}-\frac{5}{4}\times\frac{1}{3}$$
$$= \frac{1}{4}+\frac{7\times(-2)}{3\times 5}-\frac{5\times 1}{4\times 3}$$
$$= \frac{1}{4}+\frac{-14}{3\times 5}-\frac{5}{4\times 3}$$
$$= \frac{1\times 3\times 5}{4\times 3\times 5}+\frac{-14\times 4}{3\times 5\times 4}-\frac{5\times 5}{4\times 3\times 5}$$
$$= \frac{15-56-25}{4\times 3\times 5}$$
$$= \frac{-66}{4\times 3\times 5}$$
$$= -\frac{2\times 3\times 11}{2\times 2\times 3\times 5}$$
$$= \boxed{-\frac{11}{10}}$$

$$D=\frac{15}{-26}\times\frac{-39}{25}\times\frac{-2}{9}$$
$$=-\frac{15\times39\times2}{26\times25\times9}$$
$$=-\frac{\cancel{5}\times\cancel{3}\times\cancel{3}\times\cancel{13}\times\cancel{2}}{\cancel{2}\times\cancel{13}\times\cancel{5}\times5\times\cancel{3}\times\cancel{3}}$$
$$=\boxed{-\frac{1}{5}}$$

$$E=\frac{\frac{1}{2}+\frac{2}{5}}{\frac{3}{4}-\frac{4}{7}}$$
$$=\frac{\frac{1\times5}{2\times5}+\frac{2\times2}{5\times2}}{\frac{3\times7}{4\times7}-\frac{4\times4}{7\times4}}$$
$$=\frac{\frac{5+4}{2\times5}}{\frac{21-16}{4\times7}}$$
$$=\frac{\frac{9}{2\times5}}{\frac{5}{4\times7}}$$
$$=\frac{9}{2\times5}\times\frac{4\times7}{5}$$
$$=\frac{9\times4\times7}{2\times5\times5}$$
$$=\frac{9\times\cancel{2}\times2\times7}{\cancel{2}\times5\times5}$$
$$=\boxed{\frac{126}{25}}$$

$$F=\left(\frac{1}{3}-\frac{3}{2}\right)\div\left(\frac{3}{4}-\frac{4}{5}\right)$$
$$=\left(\frac{1\times2}{3\times2}-\frac{3\times3}{2\times3}\right)\div\left(\frac{3\times5}{4\times5}-\frac{4\times4}{5\times4}\right)$$
$$=\frac{2-9}{3\times2}\div\frac{15-16}{4\times5}$$
$$=\frac{-7}{3\times2}\div\frac{-1}{4\times5}$$
$$=\frac{-7}{3\times2}\times\frac{4\times5}{-1}$$
$$=\frac{7\times4\times5}{3\times2}$$
$$=\frac{7\times\cancel{2}\times2\times5}{3\times\cancel{2}}$$
$$=\boxed{\frac{70}{3}}$$

$$G=\frac{5\times\frac{6}{7}-4}{\frac{-7}{3}-\left(\frac{-1}{2}-\frac{5}{-3}\right)}=\frac{\frac{5\times6}{7}-\frac{4\times7}{7}}{\frac{-7}{3}-\left(\frac{-1}{2}+\frac{5}{3}\right)}$$
$$=\frac{\frac{30}{7}-\frac{28}{7}}{\frac{-7}{3}-\left(\frac{-1\times3}{2\times3}+\frac{5\times2}{3\times2}\right)}=\frac{\frac{2}{7}}{\frac{-7}{3}-\left(\frac{-3}{6}+\frac{10}{6}\right)}$$
$$=\frac{\frac{2}{7}}{\frac{-7}{3}-\frac{7}{6}}=\frac{\frac{2}{7}}{\frac{-7\times2}{3\times2}-\frac{7}{6}}$$
$$=\frac{\frac{2}{7}}{\frac{-14}{6}-\frac{7}{6}}=\frac{\frac{2}{7}}{\frac{-21}{6}}$$
$$=-\frac{2}{7}\times\frac{6}{21}=-\frac{2\times2\times\cancel{3}}{7\times7\times\cancel{3}}$$
$$=\boxed{-\frac{4}{49}}$$

EXERCICE N°3

Pour $a=-\frac{5}{3}$ et $b=\frac{7}{6}$, on a :

$$H=\frac{2a}{b}=\frac{2\times\left(-\frac{5}{3}\right)}{\frac{7}{6}}=\frac{-\frac{10}{3}}{\frac{7}{6}}=-\frac{10}{3}\times\frac{6}{7}=-\frac{10\times2\times\cancel{3}}{\cancel{3}\times7}=\boxed{-\frac{20}{7}}$$

$$I=\frac{1/a}{1/b}=\frac{\frac{1}{-\frac{5}{3}}}{\frac{1}{\frac{7}{6}}}=\frac{-\frac{3}{5}}{\frac{6}{7}}=-\frac{3}{5}\times\frac{7}{6}=-\frac{\cancel{3}\times7}{5\times\cancel{3}\times2}=\boxed{-\frac{7}{10}}$$

$$J=\frac{\frac{7}{6}+\left(-\frac{5}{3}\right)}{\frac{7}{6}-\left(-\frac{5}{3}\right)}=\frac{\frac{7}{6}+\frac{-5\times2}{3\times2}}{\frac{7}{6}+\frac{5\times2}{3\times2}}=\frac{\frac{7-10}{6}}{\frac{7+10}{6}}=\frac{-\frac{3}{6}}{\frac{17}{6}}=\frac{-\frac{1}{2}}{\frac{17}{6}}=-\frac{1}{2}\times\frac{6}{17}=-\frac{2\times\cancel{3}}{\cancel{2}\times17}=\boxed{-\frac{3}{17}}$$

$$K=-\frac{7}{10}\times\left(-\frac{20}{7}\right)=\frac{\cancel{7}\times2\times\cancel{10}}{\cancel{10}\times\cancel{7}}=\boxed{2}$$

$$L=\frac{1}{3}\times\left(-\frac{7}{10}+\left(-\frac{20}{7}\right)\right)=\frac{1}{3}\times\left(\frac{-7\times7}{10\times7}+\frac{-20\times10}{7\times10}\right)=\frac{1}{3}\times\frac{-49-200}{70}=-\frac{249}{3\times70}=-\frac{3\times83}{3\times70}=\boxed{-\frac{83}{70}}$$