

## Chapitre 5 : Nombres en écriture fractionnaire : multiplication et division

### Exercice 1 : Calculer les expressions suivantes

$$a. \frac{5}{4} \times \frac{7}{3} = \frac{5 \times 7}{4 \times 3} = \frac{35}{12}$$

$$b. \frac{3}{4} \times \frac{3}{8} = \frac{3 \times 3}{4 \times 8} = \frac{9}{32}$$

$$c. 7 \times \frac{1}{9} = \frac{7}{1} \times \frac{1}{9} = \frac{7 \times 1}{1 \times 9} = \frac{7}{9}$$

$$d. 12 \times \frac{2}{5} = \frac{12 \times 2}{5} = \frac{24}{5}$$

$$e. \frac{6}{11} \times \frac{1}{5} = \frac{6 \times 1}{11 \times 5} = \frac{6}{55}$$

$$f. \frac{2}{3} \times \frac{4}{9} = \frac{2 \times 4}{3 \times 9} = \frac{8}{27}$$

$$g. 7 \times \frac{8}{5} = \frac{7 \times 8}{5} = \frac{56}{5}$$

$$h. \frac{9}{2} \times \frac{3}{5} = \frac{9 \times 3}{2 \times 5} = \frac{27}{10}$$

$$i. \frac{15}{7} \times \frac{2}{11} = \frac{15 \times 2}{7 \times 11} = \frac{30}{77}$$

### Exercice 2 : Calculer les expressions suivantes

$$a. \frac{-7}{5} \times \frac{7}{3} = \frac{-7 \times 7}{5 \times 3} = \frac{-49}{15}$$

$$b. \frac{-5}{3} \times \frac{-5}{2} = \frac{-5 \times (-5)}{3 \times 2} = \frac{25}{6}$$

$$c. (-7) \times \frac{-3}{8} = \frac{(-7) \times (-3)}{8} = \frac{21}{8}$$

$$d. \frac{-6}{-5} \times \frac{-9}{-7} = \frac{(-6) \times (-9)}{-5 \times (-7)} = \frac{54}{35}$$

$$e. \frac{-4}{9} \times \frac{2}{3} = \frac{-4 \times 2}{9 \times 3} = \frac{-8}{27}$$

$$f. \frac{4}{-7} \times \frac{-2}{-5} = \frac{4 \times (-2)}{(-7) \times (-5)} = \frac{-8}{35}$$

$$g. \frac{-5}{-2} \times \frac{5}{-2} = \frac{-5 \times 5}{(-2) \times (-2)} = \frac{-25}{4}$$

$$h. -6 \times \frac{4}{7} = \frac{-6 \times 4}{7} = \frac{-24}{7}$$

**Exercice 3 : Calculer les produits suivants**

a.  $\frac{3}{5} \times \frac{2}{7} = \frac{3 \times 2}{5 \times 7} = \frac{6}{35}$

b.  $\frac{11}{23} \times \frac{9}{4} = \frac{11 \times 9}{23 \times 4} = \frac{99}{92}$

c.  $\frac{1}{3} \times \frac{5}{4} = \frac{1 \times 5}{3 \times 4} = \frac{5}{12}$

d.  $\frac{6}{5} \times \frac{3}{7} = \frac{6 \times 3}{5 \times 7} = \frac{18}{35}$

e.  $\frac{9}{14} \times \frac{3}{10} = \frac{9 \times 3}{14 \times 10} = \frac{27}{140}$

f.  $\frac{7}{13} \times \frac{7}{2} = \frac{7 \times 7}{13 \times 2} = \frac{49}{26}$

**Exercice 4 : Calculer les produits suivants**

i.  $\frac{-4}{7} \times \frac{-6}{5} = \frac{(-4) \times (-6)}{7 \times 5} = \frac{24}{35}$

j.  $\frac{8}{-11} \times \frac{-2}{3} = \frac{8 \times (-2)}{(-11) \times 3} = \frac{-16}{-33} = \frac{16}{33}$

k.  $\frac{-13}{8} \times \frac{-3}{-7} = \frac{(-13) \times (-3)}{8 \times (-7)} = \frac{39}{-56} = -\frac{39}{56}$

l.  $\frac{3}{-8} \times \frac{-17}{2} = \frac{3 \times (-17)}{(-8) \times 2} = \frac{-51}{-16} = \frac{51}{16}$

**Exercice 5 : Calculer les produits suivants**

a.  $2 \times \frac{3}{5} = \frac{2 \times 3}{5} = \frac{6}{5}$

b.  $-5 \times \frac{2}{9} = \frac{-5 \times 2}{9} = \frac{-10}{9}$

c.  $-\frac{9}{4} \times \frac{-5}{7} \times \frac{-3}{2} = -\frac{9 \times 5 \times 3}{4 \times 7 \times 2} = -\frac{135}{56}$

d.  $\frac{-2}{11} \times 2,4 = \frac{-2 \times 2,4}{11} = \frac{-4,8}{11}$

**Exercice 6 : Calculer les produits suivants**

a.  $\frac{25}{21} \times \frac{14}{15} = \frac{25 \times 14}{21 \times 15} = \frac{5 \times \cancel{7} \times 2}{\cancel{7} \times 3 \times 3 \times 5} = \frac{10}{9}$

b.  $\frac{21}{-6} \times \frac{-9}{56} = \frac{21 \times 9}{6 \times 56} = \frac{\cancel{7} \times 3 \times 9}{\cancel{7} \times 2 \times 8 \times \cancel{7}} = \frac{9}{16}$

$$c. -\frac{49}{63} \times \frac{-9}{-28} = \frac{49 \times 9}{63 \times 28} = \frac{7 \times 7 \times 9}{7 \times 9 \times 7 \times 4} = -\frac{1}{4}$$

$$d. \frac{18}{15} \times \frac{75}{-16} = \frac{18 \times 75}{15 \times (-16)} = \frac{9 \times 2 \times 15 \times 5}{15 \times 8 \times 2} = -\frac{45}{8}$$

**Exercice 7 : Calculer et donner le résultat sous la forme la plus simple possible.**

$$a. \frac{-15}{8} \times \frac{27}{-12} \times \frac{-7}{5} = \frac{15 \times 27 \times 7}{8 \times 12 \times 5} = \frac{8 \times 3 \times 27 \times 7}{8 \times 3 \times 4 \times 5} = \frac{189}{32}$$

$$b. \frac{-6}{-8} \times \frac{-10}{-9} \times \frac{56}{3} = \frac{6 \times 10 \times 56}{8 \times 9 \times 3} = \frac{3 \times 2 \times 5 \times 2 \times 3 \times 7}{8 \times 3 \times 3 \times 3} = \frac{140}{9}$$

**Exercice 8 : Donner l'inverse de chacun des nombres suivants**

a. 5 :  $\frac{1}{5}$

b.  $\frac{7}{5}$  :  $\frac{5}{7}$

c. -3 :  $-\frac{1}{3}$

d.  $-\frac{5}{8}$  :  $-\frac{8}{5}$

e.  $\frac{-3}{8}$  :  $\frac{8}{-3}$

f.  $\frac{-4}{-3}$  :  $\frac{3}{4}$

**Exercice 9 : Donner l'inverse puis l'opposé de chacun des nombres suivants**

	INVERSE	OPPOSE
$\frac{2}{3}$	$\frac{3}{2}$	$-\frac{2}{3}$
6	$\frac{1}{6}$	-6
-4	$-\frac{1}{4}$	4
$\frac{1}{15}$	15	$-\frac{1}{15}$
-0,2	$\frac{1}{-0,2} = 5$	0,2
$-\frac{4}{7}$	$-\frac{7}{4}$	$\frac{4}{7}$

**Exercice 10 : Calculer les expressions suivantes**

a.  $\frac{3}{4} \div \frac{5}{7} = \frac{3}{4} \times \frac{7}{5} = \frac{3 \times 7}{4 \times 5} = \frac{21}{20}$

b.  $\frac{7}{3} \div \frac{9}{4} = \frac{7}{3} \times \frac{4}{9} = \frac{7 \times 4}{3 \times 9} = \frac{28}{27}$

c.  $\frac{2}{3} \div 5 = \frac{2}{3} \times \frac{1}{5} = \frac{2 \times 1}{3 \times 5} = \frac{2}{15}$

d.  $\frac{5}{6} \div \frac{3}{11} = \frac{5}{6} \times \frac{11}{3} = \frac{5 \times 11}{6 \times 3} = \frac{55}{18}$

e.  $\frac{5}{7} \div (-3) = \frac{5}{7} \times \frac{1}{-3} = -\frac{5 \times 1}{7 \times 3} = -\frac{5}{21}$

f.  $\frac{5}{-6} \div \frac{8}{7} = \frac{5}{-6} \times \frac{7}{8} = \frac{5 \times 7}{-6 \times 8} = -\frac{35}{48}$

g.  $\frac{3}{-7} \div \frac{-4}{-3} = \frac{3}{-7} \times \frac{3}{4} = \frac{3 \times 3}{-7 \times 4} = -\frac{9}{28}$

h.  $\frac{5}{11} \div \frac{-3}{7} = \frac{5}{11} \times \frac{7}{-3} = -\frac{5 \times 7}{11 \times 3} = -\frac{35}{33}$

i.  $2 \div \frac{-3}{5} = 2 \times \frac{5}{-3} = -\frac{2 \times 5}{3} = -\frac{10}{3}$

**Exercice 11 : Calculer les expressions suivantes**

a.  $\frac{5}{8} \div 7 = \frac{5}{8} \times \frac{1}{7} = \frac{5 \times 1}{8 \times 7} = \frac{5}{56}$

b.  $8 \div \frac{-3}{4} = 8 \times \frac{4}{-3} = -\frac{8 \times 4}{3} = -\frac{32}{3}$

c.  $1 \div \frac{-4}{-3} = 1 \times \frac{3}{4} = \frac{3}{4}$

d.  $\frac{\frac{5}{7}}{\frac{4}{3}} = \frac{5}{7} \times \frac{3}{4} = \frac{5 \times 3}{7 \times 4} = \frac{15}{28}$

e.  $\frac{\frac{5}{6}}{\frac{1}{7}} = \frac{5}{6} \times \frac{7}{1} = \frac{5 \times 7}{6 \times 1} = \frac{35}{6}$

f.  $\frac{-8}{\frac{5}{3}} = -8 \times \frac{3}{5} = \frac{-8 \times 3}{5} = \frac{-24}{5}$

**Exercice 12 : Calculer et donner le résultat sous la forme la plus simple possible**

a.  $\frac{4}{7} \div \frac{5}{3} = \frac{4}{7} \times \frac{3}{5} = \frac{4 \times 3}{7 \times 5} = \frac{12}{35}$

b.  $\frac{2}{-5} \div \frac{1}{3} = \frac{2}{-5} \times \frac{3}{1} = \frac{2 \times 3}{-5 \times 1} = \frac{6}{-5}$

$$c. \frac{-3}{8} \div \frac{-5}{7} = \frac{-3}{8} \times \frac{7}{-5} = \frac{3 \times 7}{8 \times 5} = \frac{21}{40}$$

$$d. \frac{-7}{-3} \div \frac{-5}{2} = \frac{-7}{-3} \times \frac{2}{-5} = -\frac{7 \times 2}{3 \times 5} = -\frac{14}{15}$$

**Exercice 13 : Calculer et donner le résultat sous la forme la plus simple possible**

$$a. \frac{14}{9} \div \frac{7}{5} = \frac{14}{9} \times \frac{5}{7} = \frac{14 \times 5}{9 \times 7} = \frac{\cancel{7} \times 2 \times 5}{9 \times \cancel{7}} = \frac{10}{9}$$

$$b. \frac{3}{-8} \div \frac{1}{12} = \frac{3}{-8} \times \frac{12}{1} = -\frac{3 \times 12}{8 \times 1} = -\frac{3 \times 3 \times \cancel{4}}{\cancel{4} \times 2} = -\frac{9}{2}$$

$$c. \frac{-15}{10} \div \frac{12}{-7} = \frac{-15}{10} \times \frac{-7}{12} = \frac{15 \times 7}{10 \times 12} = \frac{\cancel{5} \times 3 \times 7}{\cancel{5} \times 2 \times \cancel{3} \times 4} = \frac{7}{8}$$

$$d. \frac{14}{15} \div \frac{-8}{5} = \frac{14}{15} \times \frac{5}{-8} = -\frac{14 \times 5}{15 \times 8} = -\frac{\cancel{7} \times \cancel{7} \times 5}{\cancel{5} \times 3 \times 4 \times 2} = -\frac{7}{12}$$

**Exercice 14 : Calculer et donner le résultat sous la forme la plus simple possible**

$$a. 7 \div \frac{4}{3} = 7 \times \frac{3}{4} = \frac{7 \times 3}{4} = \frac{21}{4}$$

$$b. \frac{5}{6} \div (-3) = \frac{5}{6} \times \frac{1}{-3} = \frac{5 \times 1}{6 \times (-3)} = -\frac{5}{18}$$

$$c. -12 \div \frac{6}{5} = -12 \times \frac{5}{6} = -\frac{12 \times 5}{6} = -\frac{\cancel{6} \times 2 \times 5}{\cancel{6}} = -10$$

**Exercice 15 : Calculer et donner le résultat sous la forme la plus simple possible**

$$a. \frac{\frac{5}{7}}{\frac{2}{3}} = \frac{5}{7} \times \frac{3}{2} = \frac{5 \times 3}{7 \times 2} = \frac{15}{14}$$

$$b. \frac{\frac{-15}{-4}}{\frac{8}{3}} = \frac{-15}{-4} \times \frac{3}{8} = \frac{15 \times 3}{4 \times 8} = \frac{4 \times 2 \times 3}{5 \times 2 \times 4} = \frac{3}{5}$$

$$c. \frac{\frac{5}{9}}{-8} = \frac{5}{9} \times \frac{1}{-8} = \frac{5 \times 1}{9 \times (-8)} = -\frac{5}{72}$$

$$d. \frac{\frac{5}{9}}{-8} = \frac{5}{9} \times \frac{-8}{-8} = -\frac{5 \times 8}{9} = -\frac{40}{9}$$

**Exercice 16 : Calculer et donner le résultat sous la forme la plus simple possible**

a.  $\frac{5}{7} \div \frac{15}{8} = \frac{5}{7} \times \frac{8}{15} = \frac{5 \times 8}{7 \times 15} = \frac{8 \times 8}{7 \times 8 \times 3} = \frac{8}{21}$

b.  $\frac{-4}{25} \div \frac{7}{15} = \frac{-4}{25} \times \frac{15}{7} = -\frac{4 \times 15}{25 \times 7} = -\frac{4 \times \cancel{5} \times 3}{5 \times 5 \times 7} = -\frac{12}{35}$

c.  $\frac{24}{6} \div \frac{-9}{11} = \frac{24}{6} \times \frac{11}{-9} = -\frac{24 \times 11}{6 \times 9} = -\frac{\cancel{6} \times 4 \times 11}{\cancel{6} \times 9} = -\frac{44}{9}$

d.  $\frac{-11}{-18} \div \frac{-8}{15} = \frac{-11}{-18} \times \frac{15}{-8} = -\frac{11 \times 15}{18 \times 8} = -\frac{11 \times 5 \times \cancel{3}}{\cancel{3} \times 6 \times 8} = -\frac{55}{48}$

e.  $18 \div \frac{-3}{5} = 18 \times \frac{5}{-3} = \frac{18 \times 5}{-3} = -\frac{6 \times \cancel{3} \times 5}{\cancel{3}} = -30$

f.  $\frac{-21}{28} \div \frac{4}{9} = \frac{-21}{28} \times \frac{9}{4} = -\frac{21 \times 9}{28 \times 4} = -\frac{\cancel{7} \times 3 \times 9}{\cancel{7} \times 4 \times 4} = -\frac{27}{16}$

**Exercice 17 : Calculer et donner le résultat sous la forme la plus simple possible**

a.  $\frac{\frac{2}{9}}{\frac{7}{27}} = \frac{2}{9} \times \frac{27}{7} = \frac{2 \times 27}{9 \times 7} = \frac{2 \times \cancel{9} \times 3}{\cancel{9} \times 7} = \frac{6}{7}$

b.  $\frac{\frac{2}{-1}}{\frac{3}{3}} = \frac{2}{-1} \times \frac{3}{-1} = -\frac{2 \times \cancel{3}}{\cancel{3} \times 1} = -2$

c.  $\frac{\frac{-3}{5}}{15} = \frac{-3}{5} \times \frac{1}{15} = -\frac{3 \times 1}{5 \times 15} = -\frac{\cancel{3} \times 1}{5 \times 5 \times \cancel{3}} = -\frac{1}{25}$

d.  $\frac{\frac{-7}{-4}}{15} = \frac{-7}{-4} \times \frac{15}{15} = \frac{7 \times 15}{6 \times 4} = \frac{7 \times \cancel{3} \times 5}{\cancel{3} \times 2 \times 4} = \frac{35}{8}$

