

Simplification et la multiplication des fractions

Exercice A :

a) $\frac{2}{5} \times \frac{5}{7} = \frac{2}{7}$ b) $\frac{41}{13} \times \frac{13}{27} = \frac{41}{27}$ c) $\frac{32}{14} \times \frac{15}{32} = \frac{15}{14}$ d) $\frac{99}{100} \times \frac{100}{101} = \frac{99}{101}$

e) $\frac{1}{2} \times \frac{2}{3} \times \frac{3}{4} = \frac{1}{4}$ f) $\frac{2}{7} \times \frac{7}{11} \times \frac{7}{9} = \frac{14}{99}$ g) $\frac{17}{23} \times \frac{4}{17} \times \frac{23}{15} = \frac{4}{15}$ h) $\frac{9}{8} \times \frac{8}{7} \times \frac{5}{7} = \frac{45}{49}$

i) $\frac{3}{4} \times \frac{4}{3} \times \frac{97}{8} = \frac{97}{8}$ j) $\frac{6}{5} \times \frac{9}{2} \times \frac{3}{6} = \frac{27}{10}$

Exercice B : Fais apparaître le(s) facteur(s) commun(s) au numérateur et au dénominateur. Puis donne le résultat sous forme d'une fraction, la plus simple possible.

E = $\frac{3}{5} \times \frac{7}{14} = \frac{3 \times 7}{5 \times 7 \times 2} = \frac{3}{10}$ F = $\frac{12}{11} \times \frac{7}{8} = \frac{4 \times 3 \times 7}{11 \times 4 \times 2} = \frac{21}{22}$ G = $\frac{2}{3} \times \frac{15}{20} = \frac{2 \times 3 \times 5}{3 \times 2 \times 5 \times 2} = \frac{1}{2}$

H = $\frac{15}{6} \times \frac{9}{40} = \frac{3 \times 5 \times 9}{2 \times 3 \times 5 \times 8} = \frac{9}{16}$ I = $\frac{9}{4} \times \frac{8}{15} = \frac{3 \times 3 \times 4 \times 2}{4 \times 3 \times 5} = \frac{6}{5}$ K = $\frac{16}{3} \times \frac{6}{24} = \frac{4 \times 4 \times 6}{3 \times 4 \times 6} = \frac{4}{3}$

Exercice C :

Poster réduit : $\frac{2}{3} \times 1 = \frac{2}{3}$ Poster agrandi : $\frac{2}{3} \times \frac{15}{12} = \frac{2 \times 3 \times 5}{3 \times 2 \times 6} = \frac{5}{6} < 1$

Le nouveau poster est réduit par rapport au premier poste par la fraction $\frac{5}{6}$

Exercice D :

a) $\frac{12}{11} \times \frac{7}{8} = \frac{8}{15}$ Donc $\frac{8}{15}$ du terrain sont occupés par des légumes.

b) $\frac{8}{15} \times 450 = 240$ Les légumes occupent 240 m² sur le terrain.

Exercice 3 page 21 :

a. $\frac{6}{10} = \frac{2 \times 3}{2 \times 5} = \frac{3}{5}$	c. $\frac{14}{12} = \frac{2 \times 7}{2 \times 6} = \frac{7}{6}$	e. $\frac{9}{12} = \frac{3 \times 3}{3 \times 4} = \frac{3}{4}$	g. $\frac{3}{6} = \frac{3 \times 1}{3 \times 2} = \frac{1}{2}$
b. $\frac{10}{14} = \frac{2 \times 5}{2 \times 7} = \frac{5}{7}$	d. $\frac{18}{16} = \frac{2 \times 9}{2 \times 8} = \frac{9}{8}$	f. $\frac{27}{30} = \frac{3 \times 9}{3 \times 10} = \frac{9}{10}$	h. $\frac{15}{18} = \frac{3 \times 5}{3 \times 6} = \frac{5}{6}$
i. $\frac{10}{25} = \frac{5 \times 2}{5 \times 5} = \frac{2}{5}$	k. $\frac{45}{100} = \frac{5 \times 9}{5 \times 20} = \frac{9}{20}$	m. $\frac{5}{20} = \frac{5 \times 1}{5 \times 4} = \frac{1}{4}$	n. $\frac{55}{30} = \frac{5 \times 11}{5 \times 6} = \frac{11}{6}$
j. $\frac{50}{35} = \frac{5 \times 10}{5 \times 7} = \frac{10}{7}$	l. $\frac{15}{40} = \frac{5 \times 3}{5 \times 8} = \frac{3}{8}$		

Exercice 7 page 21 :

a. $\frac{60}{80} = \frac{3 \times 20}{4 \times 20} = \frac{3}{4}$	b. $\frac{63}{14} = \frac{9 \times 7}{2 \times 7} = \frac{9}{2}$	c. $\frac{36}{12} = \frac{3 \times 12}{1 \times 12} = \frac{3}{1} = 3$	d. $\frac{13}{65} = \frac{1 \times 13}{5 \times 13} = \frac{1}{5}$
e. $\frac{48}{42} = \frac{8 \times 6}{7 \times 6} = \frac{8}{7}$	f. $\frac{40}{24} = \frac{5 \times 8}{3 \times 8} = \frac{5}{3}$	g. $\frac{28}{24} = \frac{7 \times 4}{6 \times 4} = \frac{7}{6}$	h. $\frac{66}{11} = \frac{6 \times 11}{1 \times 11} = \frac{6}{1} = 6$

Exercice 4 page 22 :

$$a. \frac{52}{507} = \frac{2^2 \times 13}{13^2 \times 3} = \frac{2 \times 2 \times 13}{13 \times 13 \times 3} = \frac{2 \times 2}{13 \times 3} = \frac{4}{39} \quad b. \frac{525}{945} = \frac{7 \times 5^2 \times 3}{7 \times 5 \times 3^3} = \frac{7 \times 5 \times 5 \times 3}{7 \times 5 \times 3 \times 3 \times 3} = \frac{5}{9}$$

$$c. \frac{507}{99} = \frac{13^2 \times 3}{3^2 \times 11} = \frac{13 \times 13 \times 3}{3 \times 3 \times 11} = \frac{13 \times 13}{3 \times 11} = \frac{169}{33} \quad d. \frac{1225}{525} = \frac{7^2 \times 5^2}{7 \times 5^2 \times 3} = \frac{7 \times 7 \times 5 \times 5}{7 \times 5 \times 5 \times 3} = \frac{7}{3}$$

$$e. \frac{1225}{945} = \frac{7^2 \times 5^2}{7 \times 5 \times 3^3} = \frac{7 \times 7 \times 5 \times 5}{7 \times 5 \times 3 \times 3 \times 3} = \frac{7 \times 5}{3 \times 3 \times 3} = \frac{35}{27}$$

$$f. \frac{525}{52} = \frac{7 \times 5^2 \times 3}{2^2 \times 13} = \frac{7 \times 5 \times 5 \times 3}{2 \times 2 \times 13} = \frac{525}{52} \text{ (pas de simplification)}$$

Exercice 5 page 22 :

$$104 = 2^3 \times 13 = 2 \times 2 \times 2 \times 13 ; 182 = 2 \times 7 \times 13 ; 475 = 5^2 \times 19 = 5 \times 5 \times 19 ;$$

$$399 = 3 \times 7 \times 19 ; 207 = 3^2 \times 23 = 3 \times 3 \times 23 ; 483 = 3 \times 7 \times 23.$$

$$a. \frac{104}{182} = \frac{2^3 \times 13}{2 \times 7 \times 13} = \frac{2 \times 2 \times 2 \times 13}{2 \times 7 \times 13} = \frac{2 \times 2}{7} = \frac{4}{7} \quad b. \frac{182}{475} = \frac{2 \times 7 \times 13}{5^2 \times 19} = \frac{2 \times 7 \times 13}{5 \times 5 \times 19} = \frac{182}{475} \text{ (pas de simplification)}$$

$$c. \frac{475}{399} = \frac{5^2 \times 19}{3 \times 7 \times 19} = \frac{5 \times 5 \times 19}{3 \times 7 \times 19} = \frac{25}{21} \quad d. \frac{399}{207} = \frac{3 \times 7 \times 19}{3^2 \times 23} = \frac{3 \times 7 \times 19}{3 \times 3 \times 23} = \frac{7 \times 19}{3 \times 23} = \frac{133}{69}$$

$$e. \frac{207}{483} = \frac{3^2 \times 23}{3 \times 7 \times 23} = \frac{3 \times 3 \times 23}{3 \times 7 \times 23} = \frac{3}{7} \quad f. \frac{182}{399} = \frac{2 \times 7 \times 13}{3 \times 7 \times 19} = \frac{2 \times 13}{3 \times 19} = \frac{26}{57}$$

Exercice 3 page 33:

$$a. \frac{3}{2} \times 26 = 3 \times \frac{26}{2} = 3 \times 13 = 39 \quad b. \frac{2}{3} \times 33 = 2 \times \frac{33}{3} = 2 \times 11 = 22 \quad c. \frac{20}{10} \times 9 = 2 \times 9 = 18$$

$$d. \frac{8}{5} \times 15 = 8 \times \frac{15}{5} = 8 \times 3 = 24 \quad e. \frac{3}{4} \times 40 = 3 \times \frac{40}{4} = 3 \times 10 = 30$$

Exercice 5 page 33 :

15	7	67	12,8	1,6
9	4,2	40,2	7,68	0,96

← $\times \frac{3}{5}$

Exercice 3 page 34 :

$$30 \times \frac{1}{6} = \frac{30}{6} = 5 \text{ cL} \quad 30 \times \frac{3}{10} = \frac{90}{10} = 9 \text{ cL} \quad 30 \times \frac{2}{5} = \frac{60}{5} = 12 \text{ cL}$$

$$30 - (5 + 9 + 12) = 30 - 26 = 4 \text{ cL}$$

Le verre contient 5 cL de jus d'orange, 9 cL de jus de raisin, 12 cL de jus de pomme et 4 cL de jus de mangue. $4 = \frac{4}{30} \times 30$. Le verre contient $\frac{4}{30} = \frac{2}{15}$ de jus de mangue