

► **Activité n°1**

a) $\frac{4}{16} = \frac{1}{4}$

b) $\frac{3}{7}$ irréductible

c) $\frac{7-5}{7-3} = \frac{1}{2}$

d) $\frac{7 \times 10}{2 \times 25} = \frac{7}{5}$

e) $\frac{1-12}{2+12} = \frac{-11}{14}$

f) $\frac{9 \times 6}{9-2} = \frac{54}{7}$

g) $\frac{2 \times 5 - 8}{5 \times 8 - 2} = \frac{1}{19}$

h) $\frac{-0,5 \times 9}{15} = -\frac{3}{10}$

► **Activité n°2**

a) $\frac{1}{5} + \frac{1}{3} = \frac{1}{5} \times \frac{3}{3} + \frac{1}{3} \times \frac{5}{5} = \frac{8}{15}$

b) $\frac{4}{3} - \frac{1}{6} = \frac{4}{3} \times \frac{2}{2} - \frac{1}{6} = \frac{7}{6}$

c) $\frac{5}{a} + \frac{1}{b} = \frac{5}{a} \times \frac{b}{b} + \frac{1}{b} \times \frac{a}{a} = \frac{5b+1}{ab}$

d) $-\frac{6}{x} + \frac{1}{x^2} = -\frac{6}{x} \times \frac{x}{x} + \frac{1}{x^2} = \frac{-6x+1}{x^2}$

e) $\frac{2}{3x} - \frac{1}{x} = \frac{2}{3x} - \frac{1}{x} \times \frac{3}{3} = \frac{-1}{3x}$

f) $\frac{x}{5} + \frac{5}{x} = \frac{x}{5} \times \frac{x}{x} + \frac{5}{x} \times \frac{5}{5} = \frac{x^2+25}{5x}$

► **Activité n°3**

a) $\frac{1}{6} + \frac{2}{5} = \frac{1}{6} \times \frac{5}{5} + \frac{2}{5} \times \frac{6}{6} = \frac{17}{30}$

b) $\frac{1}{2} - \frac{5}{8} = \frac{1}{2} \times \frac{4}{4} - \frac{5}{8} = \frac{-1}{8}$

c) $\frac{7}{12} - \frac{3}{8} = \frac{7}{12} \times \frac{2}{2} - \frac{3}{8} \times \frac{3}{3} = \frac{5}{24}$

► **Activité n°4**

a) $3x + \frac{1}{x} = 3x \times \frac{x}{x} + \frac{1}{x} = \frac{3x^2+1}{x}$

b) $\frac{2}{x+1} - 1 = \frac{2}{x+1} - 1 \times \frac{x+1}{x+1} = \frac{1-x}{x+1}$

c) $7 - \frac{3}{x^2} = 7 \times \frac{x^2}{x^2} - \frac{3}{x^2} = \frac{7x^2-3}{x^2}$

d) $\frac{5}{x} - \frac{3}{x^2} = \frac{5}{x} \times \frac{x}{x} - \frac{3}{x^2} = \frac{5x-3}{x^2}$

e) $\frac{2}{x-1} + \frac{1}{x} = \frac{2}{x-1} \times \frac{x}{x} + \frac{1}{x} \times \frac{x-1}{x-1} = \frac{3x-1}{x(x-1)}$

► **Activité n°5**

a) $(x+3)^2 = (x)^2 + 2 \times (x) \times (3) + (3)^2 = x^2 + 6x + 9$

b) $(\frac{1}{2} + x)^2 = (\frac{1}{2})^2 + 2 \times (\frac{1}{2}) \times (x) + (x)^2 = \frac{1}{4} + x + x^2$

c) $(2x+5)^2 = (2x)^2 + 2 \times (2x) \times (5) + (5)^2 = 4x^2 + 20x + 25$

d) $(3x + \sqrt{2})^2 = (3x)^2 + 2 \times (3x) \times (\sqrt{2}) + (\sqrt{2})^2 = 9x^2 + 6\sqrt{2}x + 2$

e) $(\sqrt{3} + 3\sqrt{2})^2 = (\sqrt{3})^2 + 2 \times (\sqrt{3}) \times (3\sqrt{2}) + (3\sqrt{2})^2 = 3 + 6\sqrt{6} + 18 = 21 + 6\sqrt{6}$

f) $(x + \frac{1}{x})^2 = (x)^2 + 2 \times (x) \times (\frac{1}{x}) + (\frac{1}{x})^2 = x^2 + 2 + \frac{1}{x^2}$

► **Activité n°6**

a) $(x-5)^2 = (x)^2 - 2 \times (x) \times (5) + (5)^2 = x^2 - 10x + 25$

b) $(7-x)^2 = (7)^2 - 2 \times (7) \times (x) + (x)^2 = 49 - 14x + x^2$

c) $(4x-1)^2 = (4x)^2 - 2 \times (4x) \times (1) + (1)^2 = 16x^2 - 8x + 1$

d) $(\sqrt{7}-x)^2 = (\sqrt{7})^2 - 2 \times (\sqrt{7}) \times (x) + (x)^2 = 7 - 2\sqrt{7}x + x^2$

e) $(\sqrt{5}-6\sqrt{2})^2 = (\sqrt{5})^2 - 2 \times (\sqrt{5}) \times (6\sqrt{2}) + (6\sqrt{2})^2 = 5 - 12\sqrt{10} + 72 = 77 - 12\sqrt{10}$

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► **Activité n°7**

- a) $x^2 - 3^2 = (x - 3)(x + 3)$
b) $x^2 - 16 = x^2 - (4)^2 = (x - 4)(x + 4)$
c) $49 - x^2 = (7)^2 - x^2 = (7 - x)(7 + x)$
d) $4x^2 - 25 = (2x)^2 - (5)^2 = (2x - 5)(2x + 5)$
e) $36 - 9x^2 = (6)^2 - (3x)^2 = (6 - 3x)(6 + 3x)$

► **Activité n°8**

- a) $x^2 + 6x + 9 = (x + 3)^2$
b) $x^2 - 4x + 4 = (x - 2)^2$
c) $x^2 + 14x + 49 = (x + 7)^2$
d) $4x^2 - 20x + 25 = (2x - 5)^2$

► **Activité n°9**

- a) $10^3 \times 10^4 = 10^7$
b) $10^{-5} \times 10^2 \times 10^7 = 10^4$
c) $10^{-2} \times 10^{\dots} = 10^8$
d) $\frac{1}{10^5} = 10^{-5}$
e) $\frac{1}{10^{-4}} = 10^4$
f) $\frac{10^9}{10^3} = 10^6$
g) $\frac{10^2}{10^{-9}} = 10^{11}$
h) $10^{-4} \times \frac{10^6}{10^{-2}} = 10^{-4} \times 10^8 = 10^4$

- i) $(10^{-4})^2 = 10^{-8}$
j) $(10^3)^4 = 10^{12}$
k) $(10^2 \times 10^{-7})^3 = (10^{-5})^3 = 10^{-15}$
l) $3^8 \times \frac{3^{-5}}{3^{-4}} = 3^8 \times 3^{-1} = 3^7$
m) $\left(\frac{2^4}{2^7}\right)^2 = (2^{-3})^2 = 2^{-6}$

► **Activité n°10**

- a) $10\,000 = 10^4$
b) $400\,000 = 4 \times 10^5$
c) $0,001 = 10^{-3}$
d) $-0,000\,3 = -3 \times 10^{-4}$
e) $4\,897,5 = 4,8975 \times 10^3$
f) $0,000\,061\,2 = 6,12 \times 10^{-5}$

► **Activité n°11**

- a) 5,234 km correspond à 5234 m
b) 125,67 g correspond à 0,125 67 kg
c) 0,34 m² correspond à 3 400 cm²

► **Activité n°12**

vitesse	distance	temps
$60 \text{ km} \cdot \text{h}^{-1}$	300 km	5 h
$90 \text{ km} \cdot \text{h}^{-1}$	225 km	2 h 30 min
$8 \text{ m} \cdot \text{s}^{-1}$	2,4 km	5 min

► **Activité n°13**

a) $(\sqrt{10})^2 = 10$

b) $(-\sqrt{10})^2 = 10$

c) $-(\sqrt{10})^2 = -10$

d) $(2\sqrt{10})^2 = 40$

e) $\sqrt{12} = \sqrt{4 \times 3} = 2\sqrt{3}$

f) $\sqrt{18} = \sqrt{9 \times 2} = 3\sqrt{2}$

g) $\sqrt{28} = \sqrt{4 \times 7} = 2\sqrt{7}$

h) $\sqrt{45} = \sqrt{9 \times 5} = 3\sqrt{5}$

h) $\frac{1}{\sqrt{2}} = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$

i) $\frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$

j) $\frac{\sqrt{35}}{\sqrt{20}} = \frac{\sqrt{7 \times 5}}{\sqrt{4 \times 5}} = \frac{\sqrt{7} \times \sqrt{5}}{\sqrt{4} \times \sqrt{5}} = \frac{\sqrt{7}}{2}$