

# Chapitre 3 - Opérations sur les relatifs

## C.1

$$\text{a) } (+0,6) + (+1,5) = 2,1 \quad \text{b) } (+0,8) + (-1,5) = -0,7$$

$$\text{c) } (-5,1) + (-0,7) = -5,8 \quad \text{d) } (-3,2) + (-0,5) = -3,7$$

$$\text{e) } (+1,4) + (-7) = -5,6 \quad \text{f) } (+2,2) + (+4,9) = 7,1$$

## C.2

$$\begin{aligned} \text{a) } & (+3) + (-5) + (+1) + (-1) \\ & = [(+3) + (+1)] + [(-5) + (-1)] \\ & = (+4) + (-6) \\ & = -2 \end{aligned}$$

$$\begin{aligned} \text{b) } & (-2) + (-4) + (+6) + (-1) + (+7) \\ & = [(+6) + (+7)] + [(-1) + (-2) + (-4)] \\ & = (+13) + (-7) \\ & = +6 \end{aligned}$$

$$\begin{aligned} \text{c) } & (+7) + (-2) + (-4) + (+3) \\ & = [(+7) + (+3)] + [(-2) + (-4)] \\ & = (+10) + (-6) \\ & = +4 \end{aligned}$$

$$\begin{aligned} \text{d) } & (-2) + (+1) + (+4) + (-3) \\ & = [(+1) + (+4)] + [(-2) + (-3)] \\ & = (+5) + (-5) \\ & = 0 \end{aligned}$$

$$\text{C.3 a) } (+5) - (+3)$$

$$= (+5) + (-3)$$

$$= +2$$

$$\text{c) } (-7) - (+13)$$

$$= (-7) + (-13)$$

$$= -20$$

$$\text{b) } (-3) - (-3)$$

$$= (-3) + (+3)$$

$$= 0$$

$$\text{C.4 a) } (+2) + (-5)$$

$$= -3$$

$$\text{b) } (-3) - (-4)$$

$$= (-3) + (+4)$$

$$= +1$$

$$\text{c) } (-5) - (+2)$$

$$= (-5) + (-2)$$

$$= -7$$

$$\text{d) } (+2) - (-7)$$

$$= (+2) + (+7)$$

$$= +9$$

$$\text{e) } (-6) + (-2)$$

$$= (-8)$$

$$\text{f) } (+7) - (+2)$$

$$= (+7) + (-2)$$

$$= +5$$

## C.5

$$\begin{aligned} \text{a) } & (+2) + (-4) - (+8) + (+1) - (-7) \\ & = (+2) + (-4) + (-8) + (+1) + (+7) \\ & = [(+2) + (+1) + (+7)] + [(-4) + (-8)] \\ & = (+10) + (-12) \\ & = -2 \end{aligned}$$

$$\begin{aligned} \text{b) } & (+7) - (-1) - (-5) + (+3) + (-4) \\ & = (+7) + (+1) + (+5) + (+3) + (-4) \\ & = [(+7) + (+1) + (+5) + (+3)] + (-4) \\ & = (+16) + (-4) \\ & = +12 \end{aligned}$$

$$\begin{aligned} \text{c) } & (-5) + (+2) - (-4) - (+7) - (-1) \\ & = (-5) + (+2) + (+4) + (-7) + (+1) \\ & = [(+2) + (+4) + (+1)] + [(-5) + (-7)] \\ & = (+7) + (-12) \\ & = -5 \end{aligned}$$

## C.6 1

$$\begin{aligned} & (+2) - (+8) - (-4) + (-3) \\ & = 2 - 8 + 4 - 3 \\ & = 6 - 11 \\ & = -5 \end{aligned}$$

## 2

$$\begin{aligned} & (-7) - (-3) + (+5) - (+4) \\ & = -7 + 3 + 5 - 4 \\ & = 8 - 11 \\ & = -3 \end{aligned}$$

$$\text{C.7 a) } 5 - 3 + 7 + 2 - 5 - 4$$

$$= 14 - 12$$

$$= 2$$

$$\text{b) } -2 - 3 + 4 - 8 + 5$$

$$= 9 - 13$$

$$= -4$$

$$\text{c) } 3 - 8 - 10 + 4 + 7$$

$$= 14 - 18$$

$$= -4$$

$$\text{d) } 11 - 24 + 12 - 11$$

$$= 23 - 35$$

$$= -12$$

$$\text{C.8 a) } 2 - 7 + 5 - 4 - 9$$

$$= 7 - 20$$

$$= -13$$

## b

$$2 + 3 - (5 - 9)$$

$$= 2 + 3 - (-4)$$

$$= 2 + 3 + 4$$

$$= 9$$

$$\text{c) } -2 + 9 - (3 + 7)$$

$$= -2 + 9 - 10$$

$$= 9 - 12$$

$$= -3$$

$$\text{d) } (3 + 2) + [3 - (4 - 7)] - 2$$

$$= 5 + [3 - (-3)] - 2$$

$$= 5 + (3 + 3) - 2$$

$$= 5 + 6 - 2$$

$$= 11 - 2 = 9$$

$$\text{C.9 a) } (-2) \times 3$$

$$= -(2 \times 3)$$

$$= -6$$



$$\begin{aligned} \text{b) } & -4 \times (-3) \\ & = 4 \times 3 \\ & = 12 \end{aligned}$$

$$\begin{aligned} \text{c) } & (+2,5) \times (-5) \\ & = -(2,5 \times 5) \\ & = -12,5 \end{aligned}$$

$$\begin{aligned} \text{d) } & (-2,4) \times (-1,5) \\ & = +(2,4 \times 1,5) \\ & = 3,6 \end{aligned}$$

×	-5	+2	-1,4
3	-15	6	-4,2
-5	25	-10	7
+20	-100	40	-28

C.10

C.11

a) Ce calcul est le produit de 3 nombres négatifs : son signe est négatif.

$$(-1) \times (-1) \times (-1) = -1$$

b) Ce calcul est le produit de 4 nombres négatifs : son signe est positif.

$$(-1) \times (-1) \times (-1) \times (-1) = 1$$

c) Ce produit comprend trois facteurs négatifs : son signe est négatif.

$$(-1) \times (-1) \times (+1) \times (-1) = -1$$

d) Il y a 6 facteurs négatifs : ce produit est positif.

C.12

$$\begin{aligned} \text{a) } & (+4) \times (-0,1) \times 10 \times (-1) \times 0,25 \\ & = 4 \times 0,1 \times 10 \times 1 \times 0,25 \\ & = [4 \times 0,25] \times [10 \times 0,1] \\ & = 1 \times 1 \\ & = 1 \end{aligned}$$

$$\begin{aligned} \text{b) } & -5 \times 0,1 \times (-4) \times (-5) \times 4 \times (-2) \times 3 \\ & = 5 \times 0,1 \times 4 \times 5 \times 4 \times 2 \times 3 \\ & = [5 \times 2 \times 0,1] \times [4 \times 5] \times [4 \times 3] \\ & = 1 \times 20 \times 12 \\ & = 240 \end{aligned}$$

C.13

$$\begin{aligned} \text{a) } & (-2) \times (+4) \times (-5) \\ & = +2 \times 4 \times 5 \\ & = 40 \end{aligned}$$

$$\begin{aligned} \text{b) } & (-10) \times (+1) \times (-2) \times (-5) \\ & = -10 \times 1 \times 2 \times 5 \\ & = -100 \end{aligned}$$

$$\begin{aligned} \text{c) } & -5 + 2 \times (-3) \\ & = -5 + (-6) \\ & = -11 \end{aligned}$$

$$\begin{aligned} \text{d) } & 2 - 2 \times (-2) \\ & = 2 - (-4) \\ & = 2 + 4 \\ & = 6 \end{aligned}$$

C.14 a)  $-3 + 5 \times (-2)$   
 $= -10$   
 $= -13$

$$\begin{aligned} \text{b) } & (-6) \times (-2) - 5 \\ & = 12 - 5 \\ & = 7 \end{aligned}$$

$$\begin{aligned} \text{c) } & -2 + 5 - 4 \times 2 \\ & = -2 + 5 - 8 \\ & = 5 + (-2 - 8) \\ & = 5 - 10 \\ & = -5 \end{aligned}$$

$$\begin{aligned} \text{d) } & 4 \times (-5) - 5 \\ & = -20 - 5 \\ & = -25 \end{aligned}$$

C.15

$$\begin{aligned} \text{a) } & (9 - 13) \times (-2) \\ & = (-4) \times (-2) \\ & = 8 \end{aligned}$$

$$\begin{aligned} \text{b) } & (7 - 12) \times (-8 + 4) \\ & = (-5) \times (-4) \\ & = 20 \end{aligned}$$

$$\begin{aligned} \text{c) } & -(2 - 2 \times 4) + 4 \\ & = -(2 - 8) + 4 \\ & = -(-6) + 4 \\ & = 6 + 4 \\ & = 10 \end{aligned}$$

$$\begin{aligned} \text{d) } & 5 - (-2 - 3) \\ & = 5 - (-5) \\ & = 5 + 5 \\ & = 10 \end{aligned}$$

$$\begin{aligned} \text{e) } & (-3 + 5) \times (-5 - 7) \\ & = 2 \times (-12) \\ & = -24 \end{aligned}$$

$$\begin{aligned} \text{f) } & 5 - 2 \times (-3 + 5) \\ & = 5 - 2 \times 2 \\ & = 5 - 4 \\ & = 1 \end{aligned}$$

La correction est disponible en vidéo



C.16

a)  $(-3) \div (-2)$  est positive

b)  $2 \div (-1)$  est négative

c)  $(-3) \div 5$  est négative

d)  $\frac{-5}{-8}$  est positive

e)  $\frac{-3}{5}$  est négative

f)  $\frac{5}{-7}$  est négative

C.17

$$\begin{aligned} \text{a) } & \frac{-6}{2} = -\frac{6}{2} \\ & = -\frac{6 \div 2}{2 \div 2} \\ & = -\frac{3}{1} \\ & = -3 \end{aligned}$$

$$\begin{aligned} \text{b) } & \frac{15}{6} = \frac{15 \div 3}{6 \div 3} \\ & = \frac{5}{2} \end{aligned}$$

$$\begin{aligned} \text{c) } & \frac{-4}{-16} = \frac{4}{16} \\ & = \frac{4 \div 4}{16 \div 4} \\ & = \frac{1}{4} \end{aligned}$$

$$\begin{aligned} \text{d) } & \frac{21}{-14} = -\frac{21}{14} \\ & = -\frac{3}{2} \end{aligned}$$

$$\text{e) } \frac{-3}{5} = -\frac{3}{5}$$

$$\begin{aligned} \text{f) } & \frac{-150}{-100} = \frac{150}{100} \\ & = \frac{150 \div 50}{100 \div 50} \\ & = \frac{3}{2} \end{aligned}$$



C.18 a)  $(3 \times 2 - 5) \div (2 - 2 \times 2)$

$$= \frac{6 - 5}{2 - 4}$$

$$= \frac{1}{-2}$$

Ce quotient est négatif.

b)  $\frac{-3 \times (-2) + 4}{5 - 3 \times 2}$

$$= \frac{6 + 4}{5 - 6}$$

$$= \frac{10}{-1}$$

Ce quotient est négatif.

C.19 a)  $\frac{5 \times 2 - 7}{5 - 8}$

$$= \frac{10 - 7}{5 - 8}$$

$$= \frac{3}{-3}$$

$$= -1$$

b)  $\frac{3 \times (-2) + 4}{3 - 3 \times 3}$

$$= \frac{-6 + 4}{3 - 9}$$

$$= \frac{-2}{-6}$$

$$= \frac{1}{3}$$

c)  $\frac{5 - 2 \times 3}{5 \times 6}$

$$= \frac{5 - 6}{30}$$

$$= \frac{-1}{30}$$

$$= -\frac{1}{30}$$

d)  $\frac{5 - 36 \div 6}{60 - 8 \times 7}$

$$= \frac{5 - 6}{60 - 56}$$

$$= \frac{-1}{4}$$

$$= -\frac{1}{4}$$

C.20 a)  $\frac{2 - [5 - 3 \times (2 - 4)]}{2 - 15 \div 5}$

$$= \frac{2 - [5 - 3 \times (-2)]}{2 - 3}$$

$$= \frac{2 - (5 + 6)}{-1}$$

$$= \frac{2 - 11}{-1}$$

$$= \frac{-9}{-1}$$

$$= 9$$

b)  $\frac{12 \times 3 - 6 \times 6}{3 - [2 - (2 \times 5 - 12)]}$

$$= \frac{36 - 36}{3 - [2 - (2 \times 5 - 12)]}$$

$$= \frac{0}{3 - [2 - (2 \times 5 - 12)]}$$

$$= 0$$

