أحسب واختصر :

$$M = 1 + \left[\frac{2}{5} - (\frac{3}{5} - 2)\right] - (1 - \frac{1}{5})$$

$$N = \frac{2}{3} - \left[(-\frac{1}{2}) + 3\right] - \left[2 - (\frac{3}{4} - 1) + (-\frac{2}{3})\right]$$

$$* M = 1 + \left[\frac{2}{5} - \left(\frac{3}{5} - 2\right)\right] - \left(1 - \frac{1}{5}\right)$$

$$= 1 + \left[\frac{2}{5} - \frac{3}{5} + 2\right] - 1 + \frac{1}{5}$$

$$= 1 + \frac{2}{5} - \frac{3}{5} + 2 - 1 + \frac{1}{5}$$

$$= \frac{2}{5} - \frac{3}{5} + \frac{1}{5} + 1 + 2 - 1$$

$$= \frac{2 - 3 + 1}{5} + 2$$

$$= \frac{0}{5} + 2 = 2$$

$$N = \frac{2}{3} - \left[(-\frac{1}{2}) + 3\right] - \left[2 - (\frac{3}{4} - 1) + (-\frac{2}{3})\right]$$

$$= \frac{2}{3} - \left[-\frac{1}{2} + 3\right] - \left[2 - \frac{3}{4} + 1 - \frac{2}{3}\right]$$

$$= \frac{2}{3} + \frac{1}{2} - 3 - 2 + \frac{3}{4} - 1 + \frac{2}{3}$$

$$= \frac{2}{3} + \frac{2}{3} + \frac{2}{4} + \frac{3}{4} - 3 - 2 - 1$$

$$= \frac{4 \times 4}{3 \times 4} + \frac{5 \times 3}{4 \times 3} - 6$$

$$= \frac{16}{12} + \frac{15}{12} - 6$$

$$= \frac{31}{12} - \frac{72}{12} = \frac{31 - 72}{12} = -\frac{41}{12}$$

اختصر العبارات التالية حيث x عدد كسري :

$$A = 3-(x+\frac{2}{5})+(x-2)+3x$$

$$B = x+1-(2x-1)+\left[1-(x+3)\right]$$

$$C = \frac{1}{2}+\left[x-(2-x)\right]-\left[3+2x-(\frac{1}{2}+x)\right]$$

$A = 3 - x - \frac{2}{5} + x - 2 + 3x$

$= 3 - 2 - \frac{2}{5} + 3x$

$= 1 - \frac{2}{5} + 3x$

$= \frac{5}{5} - \frac{2}{5} + 3x = \frac{3}{5} + 3x$

$B = x + 1 - 2x + 1 + \left[1 - x - 3\right]$

$= x + 1 - 2x + 1 + 1 - x - 3$

$= -2x + 3 - 3$

$= -2x$

$C = \frac{1}{2} + \left[x - 2 + x\right] - \left[3 + 2x - \frac{1}{2} - x\right]$

$= \frac{1}{2} + x - 2 + x - 3 - 2x + \frac{1}{2} + x$

$= \underbrace{\frac{1}{2} + \frac{1}{2}}_{1} + \underbrace{x + x}_{2x} - 2x + x - 2 - 3$

$= 1 - 2 - 3 + x$

$= -4 + x$

اختصر المجاميع التالية :

$X = 1 + (\sqrt{5} + 2)$ ؛ $Y = \frac{2}{3} - (2 - \frac{1}{2}) + 1$

$T = (\sqrt{3} + 1) - 2\sqrt{3}$ ؛ $Z = \pi - (1 + 2\pi)$

1) أحسب :

* $a = \frac{1}{2} - [2 - (-3 + \frac{5}{2} + 1)]$

* $b = (2 - \sqrt{2} + \frac{1}{2}) - [1 - (\sqrt{2} + \frac{5}{2})] - 1$

مهما تكن الأعداد الحقيقية a و b و c

فإن :

- a-b = a + (-b)
- -(-a) = a
- -(a + b) = -a – b
- -(a-b) = -a+b
- a-(b+c) = (a-b)-c
- a-(b-c) = (a-b)+c

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

$a = \frac{1}{2} - [2 - (-3 + \frac{5}{2} + 1)]$

$= \frac{1}{2} - [2 + 3 - \frac{5}{2} - 1]$

$= \frac{1}{2} - 2 - 3 + \frac{5}{2} + 1$

$= \frac{1}{2} + \frac{5}{2} - 2 - 3 + 1$

$= \frac{6}{2} - 2 - 3 + 1$

$= 3 - 2 - 3 + 1$

$= -1$

$b = (2 - \sqrt{2} + \frac{1}{2}) - [1 - (\sqrt{2} + \frac{5}{2})] - 1$

$= 2 - \sqrt{2} + \frac{1}{2} - [1 - \sqrt{2} - \frac{5}{2}] - 1$

$= 2 - \sqrt{2} + \frac{1}{2} - 1 + \sqrt{2} + \frac{5}{2} - 1$

$= \frac{1}{2} + \frac{5}{2}$

$= \frac{6}{2} = 3$

تمرين عدد 1

أختصر العبارات التالية

$$A = \frac{3}{4} + \sqrt{2} + \left(-\frac{5}{6}\right)$$

$$B = \sqrt{5} + (-0.2) + \frac{16}{5} + \left(-\sqrt{5}\right)$$

$$C = (-2) + \sqrt{3} + \left(-\frac{5}{4}\right) + 2 + \frac{13}{4}$$

$$D = 4 - \left(\sqrt{3} + \frac{1}{2}\right) - \left(\frac{5}{4} - \sqrt{3}\right)$$

$$E = (\pi - 1{,}2) - \left(\sqrt{2} + \pi - \frac{6}{5}\right)$$

$$F = \frac{4}{21} - \left(-\sqrt{6} + \frac{5}{14} - \sqrt{2}\right) + \left(\frac{7}{6} - \sqrt{2}\right)$$

$* F = \frac{4}{21} + \sqrt{6} - \frac{5}{14} + \sqrt{2} + \frac{7}{6} - \sqrt{2}$

$= \frac{4 \times 2}{21 \times 2} - \frac{5 \times 3}{14 \times 3} + \frac{7 \times 7}{6 \times 7} + \sqrt{6}$

$= \frac{8}{42} - \frac{15}{42} + \frac{49}{42} + \sqrt{6}$

$= \frac{8 - 15 + 49}{42} + \sqrt{6}$

$= \frac{42}{42} + \sqrt{6} = 1 + \sqrt{6}$

$E = (\pi - 1{,}2) - \left(\sqrt{2} + \pi - \frac{6}{5}\right)$

$= \pi - 1{,}2 - \sqrt{2} - \pi + \frac{6}{5}$

$= -1{,}2 + \frac{6 \times 2}{5 \times 2} - \sqrt{2}$

$= -\frac{12}{10} + \frac{12}{10} - \sqrt{2}$

$= -\sqrt{2}$.

تمرين عدد 2

ليكن a و b عددان حقيقيان

1) أختصر العبارة التالية $A = a - [b - (a + 3)] - (a - b) - \left(\frac{1}{2} - b\right)$

2) أحسب $a + b$ إذا كان $A = \frac{4}{3}$

$A = a - [b - a - 3] - a + b - \frac{1}{2} + b$

$= a - b + a + 3 - a + b - \frac{1}{2} + b$

$= a + b + 3 - \frac{1}{2}$

$= a + b + \frac{6}{2} - \frac{1}{2}$

$= a + b + \frac{5}{2}$

$A = \frac{4}{3}$

$a + b + \frac{5}{2} = \frac{4}{3}$

$a + b = \frac{4 \times 2}{3 \times 2} - \frac{5 \times 3}{2 \times 3}$

$a + b = \frac{8}{6} - \frac{15}{6}$

$\boxed{a + b = \frac{-7}{6}}$

$* a+b+3a-c-b+2c$

$= a+3a+b-b-c+2c$

$= 4a+2c-c$

$= 4a+c$

$* f-(a-b+c)$

$= f-a+b-c$

$* f+(a-b+c)$

$= f+a-b+c$

$* a-(b-c)-(-a+b-c)-(-(-a)+b-(-c))$

$= a-b+c+a-b+c-(+a+b+c)$

$= a-b+c+a-b+c-a-b-c$

$= a+a-a-b-b-b+c+c-c$

$= a-3b+c$

$A = \sqrt{2}-\left[-\sqrt{2}-(3a-\pi)-(-\pi)\right]-\left[2\pi-\left(\frac{1}{2}-\sqrt{2}\right)\right]+\frac{1}{6}$

$= \sqrt{2}-\left[-\sqrt{2}-3a+\pi+\pi\right]-\left[2\pi-\frac{1}{2}+\sqrt{2}\right]+\frac{1}{6}$

$= \sqrt{2}+\sqrt{2}+3a-\pi-\pi-2\pi+\frac{1}{2}-\sqrt{2}+\frac{1}{6}$

$= \sqrt{2}+\sqrt{2}-\sqrt{2}+3a-\pi-\pi-2\pi+\frac{1\times 3}{2\times 3}+\frac{1}{6}$

$= \sqrt{2}+3a-4\pi+\frac{3}{6}+\frac{1}{6}$

$= \sqrt{2}+3a-4\pi+\frac{4}{6}$.

0

$-f$ و f متقابل