

Correction : partie 7

Niveau 1 :

$$2 \times \frac{3}{6} + 3 = \frac{\cancel{2} \times \cancel{3}}{\cancel{2} \times \cancel{3}} + 3 = 1 + 3 = 4 ; \frac{1}{5} \times 5 + 2 = \frac{1 \times \cancel{5}}{\cancel{5}} + 2 = 1 + 2 = 3 ; 2 \times \frac{4}{8} - \frac{5}{3} = \frac{\cancel{2} \times \cancel{2} \times \cancel{2}}{\cancel{2} \times \cancel{2} \times \cancel{2} \times 3} - \frac{5}{3} = \frac{1}{3} - \frac{5}{3} = \frac{1-5}{3} = \frac{-4}{3}$$

$$2 \times 3 - \frac{1}{6} = 6 - \frac{1}{6} = \frac{6 \times \mathbf{2} \times \mathbf{3}}{\mathbf{2} \times \mathbf{3}} - \frac{1}{2 \times 3} = \frac{36 - 1}{2 \times 3} = \frac{35}{6} ; 2 \times \frac{5}{6} - 3 \times \frac{1}{4} = \frac{2 \times 5}{2 \times 3} - \frac{3 \times 1}{2 \times 2} = \frac{2 \times 5 \times \mathbf{2}}{2 \times 3 \times \mathbf{2}} - \frac{3 \times 1 \times \mathbf{3}}{2 \times 2 \times \mathbf{3}} = \frac{20 - 9}{2 \times 2 \times 3} = \frac{11}{12}$$

$$\frac{6}{18} \times \frac{9}{15} - 3 = \frac{\cancel{2} \times \cancel{3} \times \cancel{3} \times \cancel{3}}{\cancel{2} \times \cancel{3} \times \cancel{3} \times 5} - 3 = \frac{1}{5} - 3 = \frac{1}{5} - \frac{3 \times \mathbf{5}}{\mathbf{5}} = \frac{1 - 15}{5} = \frac{-14}{5} ; 3 \div 2 + 5 = \frac{3}{2} + 5 = \frac{3}{2} + \frac{5 \times \mathbf{2}}{\mathbf{2}} = \frac{3 + 10}{2} = \frac{13}{2}$$

$$\frac{4}{15} + \frac{3}{27} \times \frac{15}{2} - 1 = \frac{4}{3 \times 5} + \frac{\cancel{3} \times \cancel{3} \times 5}{\cancel{3} \times \cancel{3} \times 2} - 1 = \frac{4 \times \mathbf{2}}{3 \times 5 \times \mathbf{2}} + \frac{5 \times \mathbf{5}}{3 \times 2 \times \mathbf{5}} - \frac{1 \times \mathbf{2} \times \mathbf{3} \times \mathbf{5}}{\mathbf{2} \times \mathbf{3} \times \mathbf{5}} = \frac{8 + 25 - 30}{2 \times 3 \times 5} = \frac{\cancel{3}}{2 \times \cancel{3} \times 5} = \frac{1}{10}$$

$$\frac{2}{21} \times \frac{6}{5} - \frac{3}{5} + \frac{5}{7} = \frac{2 \times \cancel{2} \times \cancel{3}}{\cancel{3} \times 7 \times 5} - \frac{3}{5} + \frac{5}{7} = \frac{4}{7 \times 5} - \frac{3 \times \mathbf{7}}{5 \times \mathbf{7}} + \frac{5 \times \mathbf{5}}{7 \times \mathbf{5}} = \frac{4 - 21 + 25}{7 \times 5} = \frac{8}{35}$$

$$\frac{5}{3} \div 2 - \frac{4}{21} \times \frac{3}{2} = \frac{5 \times \mathbf{1}}{3 \times 2} - \frac{2 \times \mathbf{2} \times \mathbf{3}}{3 \times 7 \times 2} \text{ si nous observons les dénominateurs, nous ne simplifions pas le dernier terme car nous serions obligés de réécrire l'opération comme elle est.}$$

$$= \frac{5 \times \mathbf{7}}{3 \times 2 \times \mathbf{7}} - \frac{12}{3 \times 7 \times 2} = \frac{35 - 12}{3 \times 2 \times 7} = \frac{23}{42}$$

$$\frac{15}{14} \times \frac{21}{25} - 3 = \frac{3 \times \cancel{5} \times 3 \times \cancel{7}}{2 \times \cancel{7} \times 5 \times 5} - 3 = \frac{9}{2 \times 5} - \frac{3 \times \mathbf{2} \times \mathbf{5}}{\mathbf{2} \times \mathbf{5}} = \frac{9 - 30}{2 \times 5} = \frac{-21}{10}$$

$$2 \div \frac{6}{7} - \frac{5}{27} + 6 = 2 \times \frac{7}{6} - \frac{5}{3 \times 3 \times 3} + 6 = \frac{\cancel{2} \times 7}{\cancel{2} \times 3} - \frac{5}{3 \times 3 \times 3} + 6 = \frac{7 \times \mathbf{3} \times \mathbf{3}}{3 \times \mathbf{3} \times \mathbf{3}} - \frac{5}{3 \times 3 \times 3} + \frac{6 \times \mathbf{3} \times \mathbf{3} \times \mathbf{3}}{\mathbf{3} \times \mathbf{3} \times \mathbf{3}} = \frac{63 - 5 + 162}{3 \times 3 \times 3} = \frac{220}{27}$$

Niveau 2 :

$$2 \times \frac{6}{8} - 3 = \frac{\cancel{2} \times \cancel{2} \times \cancel{3}}{2 \times \cancel{2} \times \cancel{2}} - 3 = \frac{3}{2} - 3 = \frac{3}{2} - \frac{3 \times \mathbf{2}}{\mathbf{2}} = \frac{3 - 6}{2} = \frac{-3}{2}$$

$$\frac{3}{25} \times \frac{5}{9} - 2 \times \frac{5}{30} + 4 = \frac{\cancel{3} \times \cancel{5}}{5 \times \cancel{5} \times \cancel{3} \times 3} - \frac{\cancel{2} \times 5}{3 \times \cancel{2} \times 5} + 4 = \frac{1}{3 \times 5} - \frac{5}{3 \times 5} + \frac{4 \times \mathbf{3} \times \mathbf{5}}{\mathbf{3} \times \mathbf{5}} = \frac{1 - 5 + 60}{3 \times 5} = \frac{56}{15}$$

$$\frac{15}{6} \div \frac{45}{12} + \frac{4}{5} - \frac{2}{18} \times \frac{6}{4} = \frac{15 \times 12}{6 \times 45} + \frac{4}{5} - \frac{\cancel{2} \times \cancel{2} \times \cancel{3}}{2 \times \cancel{3} \times \cancel{2} \times \cancel{2}} = \frac{\cancel{3} \times 5 \times 2 \times \cancel{2} \times \cancel{3}}{2 \times \cancel{3} \times \cancel{3} \times \cancel{5}} + \frac{4}{5} - \frac{1}{2 \times 3}$$

$$= \frac{20}{2 \times 3 \times 5} + \frac{4 \times \mathbf{2} \times \mathbf{3}}{5 \times \mathbf{2} \times \mathbf{3}} - \frac{1 \times \mathbf{5}}{2 \times 3 \times \mathbf{5}} = \frac{20 + 24 - 5}{2 \times 3 \times 5} = \frac{39}{2 \times 3 \times 5} = \frac{\cancel{3} \times 13}{2 \times \cancel{3} \times 5} = \frac{13}{10}$$

$$\frac{1}{5} \times \frac{3}{2} - 6 = \frac{1 \times 3}{5 \times 2} - 6 = \frac{3}{5 \times 2} - \frac{6 \times \mathbf{5} \times \mathbf{2}}{\mathbf{5} \times \mathbf{2}} = \frac{3 - 60}{5 \times 2} = \frac{-57}{10}$$

$$\frac{3}{7} + \frac{15}{9} \div \frac{20}{6} - 1 = \frac{3}{7} + \frac{15}{9} \times \frac{6}{20} - 1 = \frac{3}{7} + \frac{\cancel{3} \times \cancel{5} \times \cancel{2} \times 3}{\cancel{3} \times \cancel{3} \times \cancel{2} \times 5} - 1 = \frac{3}{7} + \frac{1}{2} - 1 = \frac{3 \times 2 + 1 \times 7 - 1 \times 2 \times 7}{7 \times 2} = \frac{6 + 7 - 14}{14} = \frac{-1}{14}$$

$$2 + \frac{6}{25} \times \frac{30}{24} - \frac{10}{14} = 2 + \frac{\cancel{2} \times \cancel{3} \times \cancel{2} \times \cancel{3} \times 5}{5 \times 5 \times \cancel{2} \times \cancel{2} \times \cancel{3} \times 2} - \frac{10}{14} = 2 + \frac{3}{2 \times 5} - \frac{2 \times 5}{2 \times 7} = \frac{2 \times 2 \times 7 \times 5}{2 \times 7 \times 5} + \frac{3 \times 7}{2 \times 5 \times 7} - \frac{10 \times 5}{2 \times 7 \times 5} = \frac{140 + 21 - 50}{2 \times 7 \times 5} = \frac{111}{70}$$

$$\frac{42}{49} \div \frac{15}{35} - \frac{2}{27} \times 3 + 4 \times \frac{5}{24} - \frac{5}{18} \div 5 = \frac{42}{49} \times \frac{35}{15} - \frac{2 \times 3}{27} + \frac{4 \times 5}{24} - \frac{5}{18} \times \frac{1}{5} = \frac{\cancel{2} \times \cancel{3} \times \cancel{7} \times \cancel{5} \times \cancel{7}}{\cancel{7} \times \cancel{7} \times 3 \times \cancel{5}} - \frac{2 \times \cancel{3}}{\cancel{3} \times \cancel{3} \times 3} + \frac{\cancel{2} \times \cancel{2} \times 5}{\cancel{2} \times \cancel{2} \times 2 \times 3} - \frac{5 \times 1}{2 \times 3 \times 3 \times \cancel{5}} = \frac{6}{3} - \frac{2}{3 \times 3} + \frac{5}{2 \times 3} - \frac{1}{2 \times 3 \times 3} = \frac{6 \times 3 \times 2}{3 \times 3 \times 2} - \frac{2 \times 2}{3 \times 3 \times 2} + \frac{5 \times 3}{2 \times 3 \times 3} - \frac{1}{2 \times 3 \times 3} = \frac{36 - 4 + 15 - 1}{2 \times 3 \times 3} = \frac{46}{2 \times 3 \times 3} = \frac{\cancel{2} \times 23}{\cancel{2} \times 3 \times 3} = \frac{23}{9}$$

Niveau 3 :

$$\frac{5}{4} - \frac{4}{12} \times \frac{3}{7} + \frac{5}{25} \times \frac{15}{14} = \frac{5}{2 \times 2} - \frac{2 \times 2 \times \cancel{3}}{2 \times 2 \times \cancel{3} \times 7} + \frac{\cancel{5} \times 3 \times \cancel{5}}{\cancel{5} \times \cancel{5} \times 2 \times 7} = \frac{5 \times 7}{2 \times 2 \times 7} - \frac{4}{2 \times 2 \times 7} + \frac{3 \times 2}{2 \times 7 \times 2} = \frac{35 - 4 + 6}{2 \times 2 \times 7} = \frac{37}{28}$$

$$\frac{30}{21} \div \frac{45}{9} - \frac{14}{15} \times \frac{25}{21} = \frac{30}{21} \times \frac{9}{45} - \frac{14 \times 25}{15 \times 21} = \frac{3 \times \cancel{2} \times \cancel{5} \times \cancel{3} \times 3}{3 \times 7 \times \cancel{3} \times \cancel{3} \times \cancel{5}} - \frac{2 \times 7 \times \cancel{5} \times 5}{3 \times \cancel{5} \times 3 \times 7} = \frac{18}{3 \times 3 \times 7} - \frac{70}{3 \times 3 \times 7} = \frac{18 - 70}{3 \times 3 \times 7} = \frac{-52}{63}$$

$$\frac{35}{14} \times \frac{9}{15} - \frac{9}{18} + \frac{6}{5} \times \frac{15}{9} - \frac{8}{14} \times \frac{21}{3} + 5 = \frac{\cancel{5} \times \cancel{7} \times \cancel{3} \times 3}{2 \times \cancel{7} \times \cancel{3} \times \cancel{5}} - \frac{\cancel{3} \times \cancel{3}}{2 \times \cancel{3} \times \cancel{3}} + \frac{2 \times \cancel{3} \times \cancel{3} \times \cancel{5}}{\cancel{5} \times \cancel{3} \times \cancel{3}} - \frac{2 \times 2 \times \cancel{2} \times \cancel{3} \times \cancel{7}}{2 \times \cancel{7} \times \cancel{3}} + 5 = \frac{3}{2} - \frac{1}{2} + 2 - \frac{8}{2} + 5 = \frac{3}{2} - \frac{1}{2} + \frac{2 \times 2}{2} - \frac{8}{2} + \frac{5 \times 2}{2} = \frac{3 - 1 + 4 - 8 + 10}{2} = \frac{8}{2} = \frac{2 \times \cancel{2} \times 2}{\cancel{2}} = 4$$

$$\frac{42 \times 40}{28 \ 56} - \frac{30 \times 9}{21 \ 45} + \frac{35 \times 12}{14 \ 20} - 2 + \frac{42 \div 35}{49 \ 15} = \frac{42 \times 40}{28 \times 56} - \frac{30 \times 9}{21 \times 45} + \frac{35 \times 12}{14 \times 20} - 2 + \frac{42}{49} \times \frac{15}{35}$$

$= \frac{\cancel{2} \times \cancel{3} \times \cancel{7} \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 5}{2 \times \cancel{2} \times 7 \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 7} - \frac{\cancel{3} \times \cancel{2} \times \cancel{5} \times \cancel{3} \times \cancel{3}}{\cancel{3} \times 7 \times \cancel{3} \times \cancel{3} \times \cancel{5}} + \frac{\cancel{5} \times \cancel{7} \times \cancel{2} \times \cancel{2} \times 3}{2 \times \cancel{7} \times \cancel{2} \times \cancel{2} \times \cancel{5}} - 2 + \frac{2 \times \cancel{3} \times \cancel{7} \times \cancel{5} \times 3}{7 \times \cancel{7} \times \cancel{5} \times \cancel{7}}$ observons ce qui est judicieux de simplifier avant de simplifier, soyons attentif.

$$= \frac{105}{2 \times 7 \times 7} - \frac{2}{7} + \frac{21}{2 \times 7} - 2 + \frac{18}{7 \times 7} = \frac{105}{2 \times 7 \times 7} - \frac{2 \times 2 \times 7}{7 \times 2 \times 7} + \frac{21 \times 7}{2 \times 7 \times 7} - \frac{2 \times 2 \times 7 \times 7}{2 \times 7 \times 7} + \frac{18 \times 2}{7 \times 7 \times 2}$$

$$= \frac{105 - 28 + 147 - 196 + 36}{2 \times 7 \times 7} = \frac{64}{2 \times 7 \times 7} = \frac{2 \times 2 \times 2 \times 2 \times 2 \times 2}{\cancel{2} \times 7 \times 7} = \frac{32}{49}$$

$$\frac{13}{56} + \frac{36}{18} \div \frac{42}{11} - 3 + \frac{18}{14} \times 5 - \frac{4}{8} \div 7 + 5 \times \frac{2}{21} - \frac{1}{28}$$

$$= \frac{13}{56} + \frac{36}{18} \times \frac{11}{42} - 3 + \frac{18 \times 5}{14} - \frac{4}{8} \times \frac{1}{7} + \frac{5 \times 2}{21} - \frac{1}{28}$$

$$= \frac{13}{2 \times 2 \times 2 \times 7} + \frac{2 \times \cancel{3} \times 2 \times \cancel{3} \times 11}{2 \times 3 \times \cancel{3} \times 2 \times \cancel{3} \times 7} - 3 + \frac{2 \times 3 \times 3 \times 5}{2 \times 7} - \frac{2 \times 2 \times 1}{2 \times 2 \times 2 \times 7} + \frac{5 \times 2}{3 \times 7} - \frac{1}{2 \times 2 \times 7}$$

de même, observons avant de simplifier

$$= \frac{13}{2 \times 2 \times 2 \times 7} + \frac{44}{2 \times 3 \times 2 \times 7} - 3 + \frac{90}{2 \times 7} - \frac{4}{2 \times 2 \times 2 \times 7} + \frac{10}{3 \times 7} - \frac{1}{2 \times 2 \times 7}$$

$$= \frac{13 \times 3}{2 \times 2 \times 2 \times 7 \times 3} + \frac{44 \times 2}{2 \times 3 \times 2 \times 7 \times 2} - \frac{3 \times 2 \times 2 \times 2 \times 3 \times 7}{2 \times 2 \times 2 \times 3 \times 7} + \frac{90 \times 2 \times 2 \times 3}{2 \times 7 \times 2 \times 2 \times 3} - \frac{4 \times 3}{2 \times 2 \times 2 \times 7 \times 3} + \frac{10 \times 2 \times 2 \times 2}{3 \times 7 \times 2 \times 2 \times 2} - \frac{1 \times 2 \times 3}{2 \times 2 \times 7 \times 2 \times 3}$$

$$= \frac{39 + 88 - 504 + 1080 - 12 + 80 - 6}{2 \times 2 \times 2 \times 3 \times 7} = \frac{765}{2 \times 2 \times 2 \times 3 \times 7} = \frac{3 \times 5 \times \cancel{3} \times 17}{2 \times 2 \times 2 \times \cancel{3} \times 7} = \frac{255}{56}$$

Niveau 4 : le secret pour arriver au résultat est de prendre son temps, ajouter une ligne s'il le faut et penser à simplifier judicieusement le plus rapidement possible! Attention, la position des parenthèses peut transformer un calcul !

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

$$= \frac{7}{2} - \left(\frac{-9}{2}\right) = \frac{7 + 9}{2} = \frac{16}{2} = \frac{\cancel{2} \times 2 \times 2 \times 2}{\cancel{2}} = 8$$

$$\frac{3}{5} - \frac{4}{3} \left(\frac{2}{5} + 1\right) - 2 = \frac{3}{5} - \frac{4}{3} \left(\frac{2}{5} + \frac{1 \times 5}{5}\right) - 2 = \frac{3}{5} - \frac{4}{3} \left(\frac{2+5}{5}\right) - 2 = \frac{3}{5} - \frac{4 \times 7}{3 \times 5} - 2$$

$$= \frac{3}{5} - \frac{28}{3 \times 5} - 2 = \frac{3 \times 3}{5 \times 3} - \frac{28}{3 \times 5} - \frac{2 \times 3 \times 5}{3 \times 5} = \frac{9 - 28 - 30}{3 \times 5} = \frac{-49}{15}$$

$$5 - \frac{3}{5} \left(4 - \frac{1}{6}\right) + \frac{2}{10} = 5 - \frac{3}{5} \left(\frac{4 \times 2 \times 3}{2 \times 3} - \frac{1}{2 \times 3}\right) + \frac{2}{10} = 5 - \frac{3}{5} \left(\frac{24 - 1}{2 \times 3}\right) + \frac{2}{10} = 5 - \frac{\cancel{3} \times 23}{5 \times 2 \times \cancel{3}} + \frac{2}{10}$$

$$= 5 - \frac{23}{5 \times 2} + \frac{2}{2 \times 5} = \frac{5 \times 2 \times 5}{2 \times 5} - \frac{23}{2 \times 5} + \frac{2}{2 \times 5} = \frac{50 - 23 + 2}{2 \times 5} = \frac{29}{10}$$

$$\frac{2}{20} \times \frac{15}{9} - \left(3 + \frac{1}{4} \times \frac{16}{12} \right) = \frac{\cancel{2} \times \cancel{3} \times \cancel{5}}{\cancel{5} \times \cancel{2} \times \cancel{2} \times 3} - \left(3 + \frac{1 \times \cancel{2} \times \cancel{2} \times \cancel{2}}{\cancel{2} \times \cancel{2} \times \cancel{2} \times 3} \right) = \frac{1}{2 \times 3} - \left(3 + \frac{1}{3} \right) = \frac{1}{2 \times 3} - \left(\frac{3 \times 3}{3} + \frac{1}{3} \right)$$

$$= \frac{1}{2 \times 3} - \frac{9+1}{3} = \frac{1}{2 \times 3} - \frac{10}{3} = \frac{1}{2 \times 3} - \frac{10 \times 2}{3 \times 2} = \frac{1 - 20}{2 \times 3} = \frac{-19}{6}$$

$$\star \star 3 - 2 \left(\frac{1}{6} - \frac{3}{36} \times \frac{24}{15} \right) + 3 \left(\frac{5}{14} \times \frac{42}{15} - \frac{28}{15} \div \frac{14}{3} \right) + \frac{1}{5}$$

$$= 3 - 2 \left(\frac{1}{2 \times 3} - \frac{\cancel{3} \times \cancel{2} \times \cancel{2} \times \cancel{3}}{\cancel{2} \times \cancel{3} \times \cancel{2} \times \cancel{3} \times 5} \right) + 3 \left(\frac{\cancel{5} \times \cancel{2} \times \cancel{3} \times \cancel{7}}{\cancel{2} \times \cancel{7} \times \cancel{3} \times 5} - \frac{28 \times 3}{15 \times 14} \right) + \frac{1}{5}$$

$$= 3 - 2 \left(\frac{1}{2 \times 3} - \frac{4}{2 \times 3 \times 5} \right) + 3 \left(1 - \frac{\cancel{2} \times \cancel{2} \times \cancel{7} \times \cancel{3}}{\cancel{3} \times \cancel{5} \times \cancel{2} \times \cancel{7}} \right) + \frac{1}{5} = 3 - 2 \left(\frac{1 \times 5}{2 \times 3 \times 5} - \frac{4}{2 \times 3 \times 5} \right) + 3 \left(\frac{1 \times 5}{5} - \frac{2}{5} \right) + \frac{1}{5}$$

$$= 3 - 2 \left(\frac{5-4}{2 \times 3 \times 5} \right) + 3 \left(\frac{5-2}{5} \right) + \frac{1}{5} = 3 - \frac{\cancel{2} \times 1}{\cancel{2} \times 3 \times 5} + 3 \times \frac{3}{5} + \frac{1}{5} = 3 - \frac{\cancel{2} \times 1}{\cancel{2} \times 3 \times 5} + \frac{3 \times 3}{5} + \frac{1}{5} = 3 - \frac{1}{3 \times 5} + \frac{9}{5} + \frac{1}{5}$$

$$= \frac{3 \times 5 \times 3}{5 \times 3} - \frac{1}{3 \times 5} + \frac{9 \times 3}{5 \times 3} + \frac{1 \times 3}{5 \times 3} = \frac{45 - 1 + 27 + 3}{3 \times 5} = \frac{74}{15}$$

$$\star \star \frac{5}{4} - \left(\frac{5}{3} + \frac{1}{18} \times \frac{6}{5} \right) + 3 \times \frac{9}{15} - \left(\frac{14}{3} \div 56 + \frac{25}{14} \times \frac{21}{75} \right) - 2$$

$$= \frac{5}{4} - \left(\frac{5}{3} + \frac{1 \times \cancel{2} \times \cancel{3}}{\cancel{2} \times \cancel{3} \times 3 \times 5} \right) + \frac{3 \times \cancel{3} \times \cancel{3}}{\cancel{3} \times 5} - \left(\frac{14}{3} \times \frac{1}{56} + \frac{\cancel{5} \times \cancel{5} \times \cancel{3} \times \cancel{7}}{\cancel{2} \times \cancel{7} \times \cancel{3} \times \cancel{5} \times 5} \right) - 2$$

$$= \frac{5}{4} - \left(\frac{5}{3} + \frac{1}{3 \times 5} \right) + \frac{9}{5} - \left(\frac{\cancel{2} \times \cancel{7} \times 1}{3 \times 2 \times 2 \times \cancel{2} \times \cancel{7}} + \frac{1}{2} \right) - 2 = \frac{5}{4} - \left(\frac{5 \times 5}{3 \times 5} + \frac{1}{3 \times 5} \right) + \frac{9}{5} - \left(\frac{1}{2 \times 2 \times 3} + \frac{1 \times 2 \times 3}{2 \times 2 \times 3} \right) - 2$$

$$= \frac{5}{2 \times 2} - \frac{25+1}{3 \times 5} + \frac{9}{5} - \frac{1+6}{2 \times 2 \times 3} - 2 = \frac{5 \times 3 \times 5}{2 \times 2 \times 3 \times 5} - \frac{26 \times 2 \times 2}{3 \times 5 \times 2 \times 2} + \frac{9 \times 2 \times 2 \times 3}{5 \times 2 \times 2 \times 3} - \frac{7 \times 5}{2 \times 2 \times 3 \times 5} - \frac{2 \times 2 \times 2 \times 3 \times 5}{2 \times 2 \times 3 \times 5}$$

$$= \frac{75 - 104 + 108 - 35 - 120}{2 \times 2 \times 3 \times 5} = \frac{-76}{2 \times 2 \times 3 \times 5} = \frac{-\cancel{2} \times \cancel{2} \times 19}{\cancel{2} \times \cancel{2} \times 3 \times 5} = \frac{-19}{15}$$

Niveau 5 :

Prenez votre temps et n'oubliez pas les priorités de calcul (livre 1) et surtout pensez à simplifier judicieusement.

$$\star \star \star \frac{6}{20} - 2 \left(\frac{3}{24} \times \frac{16}{15} + \left(\frac{5}{3} - \frac{4}{5} \right) \left(3 \times \frac{5}{2} \right) \right) + \left(\frac{21}{15} \div \frac{6}{5} + 3 \right)$$

$$= \frac{6}{20} - 2 \left(\frac{\cancel{3} \times \cancel{2} \times \cancel{2} \times \cancel{2}}{\cancel{2} \times \cancel{2} \times \cancel{2} \times \cancel{3} \times 5} + \left(\frac{5 \times 5}{3 \times 5} - \frac{4 \times 3}{5 \times 3} \right) \frac{3 \times 5}{2} \right) + \left(\frac{21 \times 5}{15 \times 6} + 3 \right)$$

$$= \frac{\cancel{2} \times 3}{\cancel{2} \times 2 \times 5} - 2 \left(\frac{2}{3 \times 5} + \frac{25 - \cancel{12}}{3 \times 5} \times \frac{3 \times \cancel{5}}{2} \right) + \left(\frac{\cancel{3} \times 7 \times \cancel{5}}{3 \times \cancel{5} \times 2 \times \cancel{3}} + 3 \right) = \frac{3}{2 \times 5} - 2 \left(\frac{2}{3 \times 5} + \frac{13 \times 3 \times 5}{3 \times 5 \times 2} \right) + \left(\frac{7}{3 \times 2} + 3 \right)$$

$$= \frac{3}{2 \times 5} - 2 \left(\frac{2 \times 2}{3 \times 5 \times 2} + \frac{195}{2 \times 3 \times 5} \right) + \left(\frac{7}{3 \times 2} + \frac{3 \times 2 \times 3}{2 \times 3} \right) = \frac{3}{2 \times 5} - 2 \times \frac{4 + 195}{2 \times 3 \times 5} + \frac{7 + 18}{2 \times 3}$$

$$= \frac{3}{2 \times 5} - 2 \times \frac{199}{2 \times 3 \times 5} + \frac{25}{2 \times 3} = \frac{3 \times 3}{2 \times 5 \times 3} - \frac{398}{2 \times 3 \times 5} + \frac{25 \times 5}{2 \times 3 \times 5}$$

$$= \frac{9 - 398 + 125}{2 \times 3 \times 5} = \frac{-264}{2 \times 3 \times 5} = \frac{-\cancel{2} \times \cancel{2} \times \cancel{3} \times 11}{\cancel{2} \times \cancel{3} \times 5} = \frac{-44}{5}$$

$$\star \star \star \left(2 - \frac{6}{2} \right) \left(2 + \frac{6}{2} \right) + \left(\frac{5}{2} - 3 \right) \left(\frac{5}{2} + 3 \right) - \left(\frac{1}{3} - 4 \right) \left(\frac{1}{3} + 4 \right)$$

$$= \frac{2 \times 2 - 6}{2} \times \frac{2 \times 2 + 6}{2} + \frac{5 - 3 \times 2}{2} \times \frac{5 + 3 \times 2}{2} - \frac{1 - 4 \times 3}{3} \times \frac{1 + 4 \times 3}{3}$$

$$= \frac{4 - 6}{2} \times \frac{4 + 6}{2} + \frac{5 - 6}{2} \times \frac{5 + 6}{2} - \frac{1 - 12}{3} \times \frac{1 + 12}{3} = \frac{-2}{2} \times \frac{10}{2} + \frac{-1}{2} \times \frac{11}{2} - \frac{-11}{3} \times \frac{13}{3}$$

$$= \frac{-2 \times 2 \times 5}{2 \times 2} - \frac{11}{2 \times 2} + \frac{143}{3 \times 3} = \frac{-20}{2 \times 2} - \frac{11}{2 \times 2} + \frac{143}{3 \times 3} = \frac{-20 \times 3 \times 3}{2 \times 2 \times 3 \times 3} - \frac{11 \times 3 \times 3}{2 \times 2 \times 3 \times 3} + \frac{143 \times 2 \times 2}{3 \times 3 \times 2 \times 2}$$

$$= \frac{-180 - 99 + 572}{2 \times 2 \times 3 \times 3} = \frac{293}{36}$$

$$\star \star \star 3 - \frac{12}{25} \left(-\frac{15}{4} \right) + \left(6 - \frac{21}{15} + \frac{36}{75} \div \frac{24}{20} \right) - \left(\frac{5}{13} \times \frac{39}{9} - \frac{42}{13} \times \frac{26}{21} \right)$$

$$= 3 + \frac{12}{25} \times \frac{15}{4} + \left(6 - \frac{\cancel{3} \times 7}{\cancel{3} \times 5} + \frac{36}{75} \times \frac{20}{24} \right) - \left(\frac{5 \times \cancel{3} \times \cancel{13}}{13 \times \cancel{3} \times 3} - \frac{2 \times 3 \times \cancel{7} \times 2 \times \cancel{13}}{13 \times 3 \times \cancel{7}} \right)$$

$$= 3 + \frac{\cancel{2} \times \cancel{2} \times 3 \times 3 \times 5}{5 \times 5 \times \cancel{2} \times \cancel{2}} + \left(6 - \frac{7}{5} + \frac{2 \times \cancel{3} \times \cancel{2} \times 3 \times \cancel{2} \times \cancel{2} \times 5}{5 \times 5 \times 3 \times \cancel{2} \times \cancel{2} \times \cancel{2} \times 3} \right) - \left(\frac{5}{3} - \frac{12}{3} \right)$$

$$= 3 + \frac{9}{5} + \left(\frac{6 \times 5}{5} - \frac{7}{5} + \frac{2}{5} \right) - \frac{-7}{3}$$

$$= 3 + \frac{9}{5} + \frac{30 - 7 + 2}{5} + \frac{7}{3} = \frac{3 \times 3 \times 5}{3 \times 5} + \frac{9 \times 3}{5 \times 3} + \frac{25 \times 3}{5 \times 3} + \frac{7 \times 5}{3 \times 5} = \frac{45 + 27 + 75 + 35}{3 \times 5} = \frac{182}{15}$$

$$\star\star\star -2 \left(3 - \frac{20}{6} \right) - \left(\frac{3}{2} \right) \left(-\frac{5}{2} \right) + \frac{28}{20} \div \frac{21}{15} + \left(\frac{75}{10} - \left(\frac{36}{17} \times \frac{34}{18} - \frac{35}{28} \right) \right)$$

$$= -2 \left(3 - \frac{\cancel{2} \times 2 \times 5}{\cancel{2} \times 3} \right) - \left(\frac{-3 \times 5}{2 \times 2} \right) + \frac{28}{20} \times \frac{15}{21} + \left(\frac{3 \times 5 \times 5}{2 \times 5} - \left(\frac{\cancel{2} \times \cancel{3} \times 2 \times \cancel{3} \times 2 \times \cancel{17}}{\cancel{17} \times 2 \times \cancel{3} \times 3} - \frac{5 \times \cancel{7}}{2 \times 2 \times \cancel{7}} \right) \right)$$

$$= -2 \left(\frac{3 \times 3}{3} - \frac{10}{3} \right) + \frac{15}{2 \times 2} + \frac{\cancel{2} \times \cancel{2} \times \cancel{7} \times \cancel{3} \times 5}{\cancel{2} \times \cancel{2} \times \cancel{5} \times \cancel{3} \times 7} + \left(\frac{15 \times 2}{2 \times 2} - \left(\frac{8 \times 2}{2 \times 2} - \frac{5}{2 \times 2} \right) \right)$$

$$= -2 \times \frac{9-10}{3} + \frac{15}{2 \times 2} + 1 + \frac{30-16+5}{2 \times 2}$$

$$= \frac{-2 \times (-1)}{3} + \frac{15}{2 \times 2} + 1 + \frac{19}{2 \times 2} = \frac{2 \times 2 \times 2}{3 \times 2 \times 2} + \frac{15 \times 3}{2 \times 2 \times 3} + \frac{1 \times 2 \times 2 \times 3}{2 \times 2 \times 3} + \frac{19 \times 3}{2 \times 2 \times 3}$$

$$= \frac{8+45+12+57}{2 \times 2 \times 3} = \frac{122}{2 \times 2 \times 3} = \frac{\cancel{2} \times 61}{\cancel{2} \times 2 \times 3} = \frac{61}{6}$$