

Question 1

- (1) Voir cahier.
- (2) Si a et b sont premiers entre eux alors $\text{ppcm}(a, b) = a \cdot b$
- (3) 4 et 9 sont des entiers tous les deux non premiers, mais premiers entre eux.
- (4) a) $150\mathbb{N} = \{0, 150, 300, 450, 600, 750, \dots\}$
 b) $\text{Div } 150 = \{1, 150, 2, 75, 3, 50, 5, 30, 6, 25, 10, 15\}$

Question 2

$$\begin{aligned} (1) \quad & \text{pgcd}(378, 594, 162) \\ &= 6 \cdot \text{pgcd}(63, 99, 27) \\ &= 6 \cdot 9 \text{pgcd}(7, 11, 3) \\ &= 54 \cdot 1 \\ &= 54 \end{aligned}$$

$$\begin{aligned} (2) \quad & \text{ppcm}(96, 120, 168) \\ &= 4 \cdot \text{ppcm}(24, 30, 42) \\ &= 4 \cdot 6 \text{ppcm}(4, 5, 7) \\ &= 24 \cdot \text{ppcm}(20, 7) \\ &= 24 \cdot 140 \\ &= 3360 \end{aligned}$$

Question 3

$$\begin{aligned} (1) \quad & \frac{-52}{132} \cdot \frac{36}{-65} : \left(-\frac{44}{121} \right) \\ &= -\frac{\overset{4}{\cancel{52}}}{\underset{22}{\cancel{132}}} \cdot \frac{\overset{6}{\cancel{36}}}{\underset{5}{\cancel{65}}} \cdot \frac{11}{4} \\ &= -\frac{\overset{1}{\cancel{4}} \cdot \overset{1}{\cancel{6}} \cdot \overset{1}{\cancel{11}}}{\underset{2}{\cancel{22}} \cdot \underset{1}{\cancel{5}} \cdot \underset{1}{\cancel{4}}} \\ &= -\frac{6}{10} = -\frac{3}{5} \end{aligned}$$

$$\begin{aligned} (2) \quad & \frac{52}{5} : 13 + \frac{\frac{1}{2} - \frac{56}{21}}{-3 + \frac{1}{9}} - 3,5 \\ &= \frac{\overset{4}{\cancel{52}}}{5} \cdot \frac{1}{\underset{1}{\cancel{13}}} + \frac{\frac{1}{2} - \frac{8}{3}}{-\frac{27}{9} + \frac{1}{9}} - \frac{7}{2} \\ &= \frac{4}{5} + \frac{\frac{3}{6} - \frac{16}{6}}{-\frac{26}{9}} - \frac{7}{2} \\ &= \frac{4}{5} + \frac{-\overset{1}{\cancel{13}}}{\underset{2}{\cancel{6}}} \cdot \left(-\frac{\overset{3}{\cancel{9}}}{\underset{2}{\cancel{26}}} \right) - \frac{7}{2} \\ &= \frac{4}{5} + \frac{3}{4} - \frac{7}{2} \\ &= \frac{16}{20} + \frac{15}{20} - \frac{70}{20} \\ &= -\frac{39}{20} \end{aligned}$$

$$\begin{aligned}
(3) \quad & \left(2 - \frac{14}{5}\right)^2 \cdot \left(-\frac{1}{8}\right) + \left(\frac{4}{7} - \frac{2}{9}\right) : \left(-2 + \frac{6}{14}\right) \\
&= \left(\frac{10}{5} - \frac{14}{5}\right)^2 \cdot \left(-\frac{1}{8}\right) + \left(\frac{36}{63} - \frac{14}{63}\right) : \left(-\frac{14}{7} + \frac{3}{7}\right) \\
&= \left(-\frac{4}{5}\right)^2 \cdot \left(-\frac{1}{8}\right) + \left(\frac{22}{63}\right) : \left(-\frac{11}{7}\right) \\
&= \frac{16}{25} \cdot \left(-\frac{1}{8}\right) - \frac{22}{63} \cdot \frac{7}{11} \\
&= -\frac{2}{25} - \frac{2}{9} \\
&= -\frac{18}{225} - \frac{50}{225} \\
&= -\frac{68}{225}
\end{aligned}$$

Question 4

(1) Le dénominateur commun des 3 nombres est :

$$\begin{aligned}
& \text{ppcm}(54, 45, 30) \\
&= 3 \cdot \text{ppcm}(18, 15, 10) \\
&= 3 \cdot \text{ppcm}(18, 30) \\
&= 9 \cdot \text{ppcm}(6, 5) \\
&= 9 \cdot 30 = 270
\end{aligned}$$

$$\text{Or : } \frac{89}{54} = \frac{445}{270} \text{ et } \frac{73}{45} = \frac{438}{270} \text{ et } \frac{49}{30} = \frac{441}{270}$$

$$\text{Donc : } \frac{73}{45} < \frac{49}{30} < \frac{89}{54}.$$

(2) Ici il est plus facile de choisir un numérateur commun :

$$\begin{cases} -\frac{4}{17} = -\frac{4}{17}; \\ -0,25 = -\frac{1}{4} = -\frac{4}{16}; \\ -\frac{2}{9} = -\frac{4}{18}; \end{cases}$$

$$\text{Or : } \frac{4}{18} < \frac{4}{17} < \frac{4}{16}.$$

$$\text{Donc : } -0,25 < -\frac{4}{17} < -\frac{2}{9}.$$