

4.21

$$\begin{array}{r|l}
 1008 & 2 \\
 504 & 2 \\
 252 & 2 \\
 126 & 2 \\
 63 & 3 \\
 21 & 3 \\
 7 & 7 \\
 1 & \\
 \hline
 \end{array}
 \qquad
 \begin{array}{r|l}
 540 & 2 \\
 270 & 2 \\
 135 & 3 \\
 45 & 3 \\
 15 & 3 \\
 5 & 5 \\
 1 & \\
 \hline
 \end{array}$$

$$1008 = 2^4 \cdot 3^2 \cdot 7 \qquad 540 = 2^2 \cdot 3^3 \cdot 5$$

$$\text{ppcm}(1008, 540) = 2^4 \cdot 3^3 \cdot 5 \cdot 7 = 15\,120$$

2) Appliquons l'algorithme d'Euclide pour calculer $\text{pgcd}(1008, 540)$:

$$1008 = 540 \cdot 1 + 468$$

$$540 = 468 \cdot 1 + 72$$

$$468 = 72 \cdot 6 + 36$$

$$72 = 36 \cdot 2$$

Ainsi $\text{pgcd}(1008, 540) = 36$.

La relation $\text{pgcd}(1008, 540) \cdot \text{ppcm}(1008, 540) = 1008 \cdot 540$ donne :

$$\text{ppcm}(1008, 540) = \frac{1008 \cdot 540}{36} = 15\,120.$$