Arithmetic test
Mon 22d January 24

Exercise 29. A worker wants to tile an $8\,\text{m} \times 6.5\,\text{m}$ rectangular room by juxtaposing identical tiles. No tiling joint is to be used. The tiles available are square-shaped and have sides of different possible lengths: $25\,\text{cm}$, $30\,\text{cm}$, $40\,\text{cm}$ or $50\,\text{cm}$.

1. *Compute* $\text{lcd}\left(\begin{smallmatrix}800\\650\end{smallmatrix}\right)$.

2. *The worker wants to tile the room without cutting any tile. Which sidelength would be suitable?*

3. *How many tiles will the worker use in each case?*

Exercise 30. Dominique used their calculator to simplify fraction $\frac{3990}{3420}$ and got $\frac{133}{144}$.

1. *Is the latter fraction irreducible?*

2. *Deduce the value of* $\text{lcd}\left(\begin{smallmatrix}3990\\3420\end{smallmatrix}\right)$.

Exercise 31. Let a and b be two positive integers. Assume that, after simplifying fraction $\frac{a}{b}$ first by 10, then by 5, eventually by 9, one gets the expression $\frac{21}{18}$.

1. *Determine all possible values for a and b.*

2. *Is $\frac{21}{18}$ the irreductible form of fraction $\frac{a}{b}$?*

3. *Does* $\text{lcd}\left(\begin{smallmatrix}a\\b\end{smallmatrix}\right)$ *equal 450 or 3150? Or some other integer?*

Exercise 32. Define $\begin{cases} A := 2^3 3^4 5^2 \\ B := 2^2 5^3 7 \end{cases}$.

1. *Compute* $\text{lcd}\left(\begin{smallmatrix}A\\B\end{smallmatrix}\right)$.

2. *What is the prime factor decomposition of A^2 and B^2?*

3. *Does equality* $\text{lcd}\left(\begin{smallmatrix}A^2\\B^2\end{smallmatrix}\right) = \left[\text{lcd}\left(\begin{smallmatrix}A\\B\end{smallmatrix}\right)\right]^2$ *hold?*