



LEWIS AND CLARK COLLEGE
Department of Mathematical Sciences

PUZZLE OF THE WEEK (4/6/2017 - 4/12/2017)

Problem: The letters A, B, C, D, E, F, G denote different digits. We know that

$$A \cdot B \cdot C = C \cdot D \cdot E = E \cdot F \cdot G.$$

What are the possible values for D ? Justify your claim.

Solution: The value of D must be 2.

Since $\{A, B, C\} \cap \{C, D, E\} \cap \{E, F, G\} = \emptyset$ none of the digits involved can be 0, 5 or 7. Thus, $\{A, B, C, D, E, F, G\} = \{1, 2, 3, 4, 6, 8, 9\}$. Furthermore, we see that $AB = DE$ and that $CD = FG$; consequently, $ABC = EFG$. Given that

$$ABCDEF G = 2^7 \cdot 3^4 = D \cdot (ABC)^2$$

we must have $D = 2$.