

NMSU MATH PROBLEM OF THE WEEK

Solution to Problem 1

Fall 2024

Problem 1

How many ways are there to arrange the letters of XOXOXOXO? Justify your answer.

Solution. A word out of letters in **XOXOXOXO** is decided as soon as we choose the four out of the eight spots

for one of the letters, say X. So there are

$$\binom{8}{4} = \frac{8!}{4!(8-4)!} = \frac{8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{(4 \cdot 3 \cdot 2 \cdot 1) \cdot (4 \cdot 3 \cdot 2 \cdot 1)} = 70$$

ways to arrange the letters of XOXOXOXO.