Problem of the Week
Week # 1

How many solutions are there to the equation
\[ x_1 + x_2 + x_3 + x_4 = 105 \]

\( x_1, x_2, x_3, x_4 \) nonneg integers

4 bins \( \overline{\begin{array}{cccc} x_1 & x_2 & x_3 & x_4 \end{array}} \)
3 dividers
105 objects in bins
bins can be empty i.e. \( x_i = 0 \) \quad 2 dividers can be adjacent

How many different ways to place dividers

\[
\binom{105 + 3}{3} = 204,156 \text{ ways}
\]

ANS