MATH 110 – QUIZ 5 – 2 OCTOBER 2009

Answer all of the following questions in the space provided. All answers must be explicitly calculated.

1. (6 pts.) Let S be a set with 12 elements. Determine the number of ordered partitions of S of type $(3, 4, 5)$.

$$\binom{12}{3,4,5} = \frac{12!}{3!\,4!\,5!} = \frac{12 \cdot 11 \cdot 10 \cdot \overset{3}{9} \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2}{3 \cdot 2 \cdot 4 \cdot 3 \cdot 2 \cdot 5 \cdot 4 \cdot 3 \cdot 2}$$

$$= 27,720$$

2. (4 pts.) How many different 12 letter words can be formed using 4 A's, 3 B's and 5 C's?

$$\binom{12}{4} \cdot \binom{8}{3} \cdot \binom{5}{5} = \binom{12}{3,4,5} = 27720$$

$\binom{12}{4}$: # positions for 4 A's

$\binom{8}{3}$: # positions for 3 B's

$\binom{5}{5}$: # positions for 5 C's.