

NAME (Print neatly!): _____

MATH 3160 (Roby)

Practice Quiz #1

January 2022

For each problem below, please explain your solution and give your final answer in two forms: (a) Expressed in terms of numbers and symbols with combinatorial significance for the problem (e.g., $2\binom{13}{5} + (n!)^2$) and (b) the actual numerical answer (if you have time). For example, in five-card poker, the number of two pair hands is given by (a) $13 \cdot \binom{4}{2} \cdot 12 \cdot \binom{4}{2} \cdot \frac{1}{2} \cdot 11 \cdot \binom{4}{1}$ and (b) 123552.

1. What is the coefficient of x^4y^3 in $(2x^2 - 3y)^5$?
2. There are four Vulcans and six Klingons. Each Vulcan (monogamously) marries one of the Klingons. In how many ways can this be done?
3. In how many ways can the letters of the word *BOOKKEEPER* be arranged if the three *E*'s cannot be listed consecutively?