

Count

$$1. \binom{4}{4} + \binom{4}{3} + \binom{4}{2}$$

unique subsets of 5 letters

$$b. 5! \binom{4}{4} + \frac{5!}{2!} \binom{4}{3} + \frac{5!}{3!} \binom{4}{2}$$

diff strings

$$2. \binom{52}{5} = 2598960$$

$$\binom{13}{2} \times \binom{4}{2}^2 \binom{11}{1} \binom{4}{1} = 13,552$$

ways

$$3. \binom{21}{16} + \binom{20}{15} \text{ ways}$$

$$4. \begin{aligned} 2 \text{ nodes} &= 2 \text{ ways} \\ 3 \text{ nodes} &= 5 \text{ ways} \\ 4 \text{ nodes} &= 14 \text{ ways} \end{aligned}$$

$$5 \text{ nodes} = 2 \cdot 5 \cdot 42 =$$

$$420 \text{ ways}$$

$$5. 3 \text{ nurses} + 4 \text{ nurses} =$$

$$3 \text{ nurse combo} = 8 \text{ combos}$$

$$4 \text{ nurses} = 9 \text{ combos}$$

$$9 + 8 = 17 \text{ combos}$$