Counting Methods and Probability HW

Count the number of possibilities for each scenario below.

1. the winner and first, second, and third runners-up in a contest with 10 finalists

10.9.8.7

2. selecting two of eight employees to attend a business seminar

3. an arrangement of letters in the word flummox

2 m's

or 71 2m's -> 21 = |

4. placing an algebra book, a geometry book, a chemistry book, an English book, and a health book on a shelf in any order

if you don't 5 (5

5. selecting 9 books to check out of the library from a reading list of twelve

12(9 = (220 ways

6. selecting and ranking your top 3 favorite subjects from the 6 you are currently taking

order matters

7. an arrangement of the word *poppy*

 $5P_5$ or $\frac{5!}{3!}$

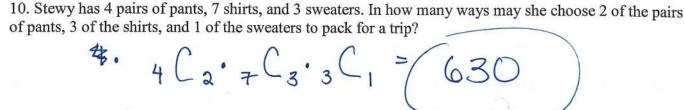
9. Among the seven nominees for two vacancies on the city council are three men and four women. In how many ways may these vacancies be filled? 4 W 3 m

a) with any two of the nominees?

b) with any two of the women?

c) with one of the men and one of the women?

$$3\binom{1}{1} + \binom{1}{1} = \binom{1}{2}$$



- 11. A bag is filled with marbles: 6 blue, 3 orange, and 4 puce. A damsel selects one marble and then puts it back and selects another. Find the probability of each situation below:
- a) P(pick orange, then puce) $\frac{3}{13} \cdot \frac{4}{13} = \left(\frac{12}{169}\right)$
- b) P(pick orange and puce in any order) $\frac{3}{13} \cdot \frac{4}{13} + \frac{4}{13} \cdot \frac{3}{13} = \frac{24}{169}$
- c) P(pick two of the same color) $\frac{6}{13} \cdot \frac{6}{13} + \frac{3}{13} \cdot \frac{3}{13} + \frac{4}{13} \cdot \frac{4}{13}$ bb or 60 or pp
- 12. The situation is the same as in question #11 except now the damsel holds onto her first marble and then selects the second. Find the probability of each situation below:
- a) P(pick orange, then puce) $\frac{3}{13} \cdot \frac{4}{12} = \left(\frac{12}{156}\right)$
- b) P(pick orange and puce in any order)

 c) P(pick two of the same color) $\frac{3}{13} \cdot \frac{4}{12} + \frac{4}{13} \cdot \frac{3}{12} = 24$
- $\frac{6}{13} \cdot \frac{5}{12} + \frac{3}{13} \cdot \frac{2}{12} + \frac{4}{13} \cdot \frac{3}{12} = \frac{48}{156}$
- 13. The probability that it will rain in the next three days is 40% or 0.4. Find the probability that it will not rain on any of the next three days.

84.27 x3. 15625 - 35437500 x3