

- 1.) How many different cars can be made if there are 6 different car models, 2 interior colors, 5 exterior colors, and 2 stereo options?
  
  
  
  
  
  
  
  
  
  
- 2.) How many different sets of answers are possible on a test with 30 true-false questions?
  
  
  
  
  
  
  
  
  
  
- 3.) The call letters for radio stations in the United States consist of either three or four letters beginning with either  $k$  or  $w$ . How many different call letters are possible?
  
  
  
  
  
  
  
  
  
  
- 4.) How many license plates are there consisting of two letters followed by four digits if the digits cannot be repeated but the letters can?
  
  
  
  
  
  
  
  
  
  
- 5.) A computer password is composed of 4 letters. How many different passwords are possible if
  - a.) No repeated letters are allowed?
  
  
  
  
  
  
  
  
  
  
  - b.) The password must start with a J, end with an L, and no repeated letters are allowed?
  
  
  
  
  
  
  
  
  
  
- 6.) How many “words” can be formed using all the letters in the word Football?

- 7.) In how many ways can 4 fig trees, 3 pear trees, and 6 apple trees be arranged along a fence line if one does not distinguish between trees of the same kind?
- 8.) The Nagy 5K Race has 25 entries. In how many ways is it possible to award prizes for the first, second, and third place?
- 9.) From a group of ten people, two are to be selected to serve on a Spring Break Party Committee. How many selections are possible?
- 10.) In how many different ways can a President, Vice President, and Secretary be selected from a class of 30 people?
- 11.) There are 5 different Math books and 4 different History books. How many ways are there to arrange them on a shelf if books of the same topic must be grouped together?
- 12.) A delicatessen serves sandwiches with the following options: 3 kinds of bread, 5 kinds of meat, and 2 kinds of cheese. How many different sandwiches are possible, assuming that one of each category is used?

13.) An urn contains fifteen balls – 8 red, 5 blue, and 2 purple. If you pick a sample of five balls from the urn in how many ways can you pick –

a.) Your sample of five balls?

b.) 5 red balls?

c.) 1 red ball, 2 blue balls, and 2 purple balls?

d.) At least 4 red balls?

14.) Cabrini is forming an activities committee of ten people. They are selecting from 15 women and 20 men.

a.) How many different committees can be formed consisting of 5 women and 5 men?

b.) How many different committees can be formed consisting of at least 8 women? (just set the problem up – don't worry about calculating out the answer)

15.) From a standard deck of 52 cards, how many 5-card hands will have 2 clubs and 3 hearts?

16.) A box contains 12 batteries, of which 4 are defective. Three (3) batteries are chosen at random, what is the probability that:

a.) Exactly two batteries are defective?

b.) All three batteries are good?

c.) At least two batteries are good?

17.) A dice is tossed 6 times. What is the probability of rolling

a.) Exactly four 5's?

b.) At least four 5's?

18.) I have 15 cds in my cd collection. My collection includes 6 Elton John cds, 4 Pearl Jam cds, 2 No Doubt cds, and 3 AC/DC cds, if I select a sample of 3 cds from my collection

a.) In **how many ways** can I pick a **RANDOM SAMPLE** of 3 cds?

b.) In how many **ORDERS** can I play any 3 of the cds?

c.) What is the **probability** I select 1 Pearl Jam cd and 2 AC/DC cds?

d.) In **how many ways** can I pick at least 2 Elton John cds?

e.) What is the **probability** I pick at least 2 Elton John cds?

19.) LeBron James has a 35% three-point shooting percentage (this means he makes 35% of his 3 point shots). If he shoots 4 three-point shots what is the probability he (hint use binomial probability)

a.) Makes EXACTLY 2 three-point shots?

b.) Makes between 1 and 3 three-point shots?

c.) Makes at most 1 three-point shot?

20.) Find the expected value for the random variable,  $x$ .

$x$	4	6	8	10
$P(x)$	0.4	0.4	0.05	0.15

21.) Mrs. Devanney draws 3 marbles from a bag containing 3 yellow and 4 white marbles. What is the expected number of yellow marbles in the sample?

22.) Solve these problems without using the calculator

a.)  $0!$

b.)  $P(5,2)$

c.)  $\binom{7}{4}$

**Permutations:**

$$P(n, r) = \frac{n!}{(n-r)!}$$

**Combinations:**

$$\binom{n}{r} = \frac{n!}{(n-r)!r!}$$

**Binomial Probability:**

$$\binom{n}{x} p^x (1-p)^{(n-x)} = \text{binompdf}(n, p, x)$$