

Help can be found in class lecture, topics review or related PowerPoints

- a) What are the keywords for using addition rule and what is its formula?
- b) What is mutually exclusive or disjoint events?
- c) What are the 4 steps in counting problems?
- d) What are the formulas for factorial, combination and permutation?
- e) What is the key difference between combination and permutation?
- f) What is the definition of random variable?
- g) What is the difference between discrete and continuous random variable? Cite two examples for each.
- h) What is the probability distribution table?
- i) To construct a probability distribution table, how many columns are needed and what must be the heading for each column?
- j) The summation of what column in probability distribution must add to one?
- k) What is the formula to find mean or expected value for a probability distribution?
- l) The summation of what column in probability distribution results in mean or expected value?
- m) How can we use TI calculator to compute mean or expected values for a probability distribution?

1) Reading *Time* and *Newsweek*.

Given: $P(\text{Reading } \textit{Newsweek}) = .20$, $P(\text{Reading } \textit{Time}) = .25$, $P(N \text{ and } T) = .05$

1) 40%

Question: What is the probability of being either a *Time* or *Newsweek* reader?

2) Table bellows are surveys from 1000 people about Smoking and having Cancer

	(smoker)	(non-smoker)	
(cancer)	100	50	150
(no cancer)	300	550	850
	400	600	1000

If one person is selected, then find

- a) The probability the person has cancer **2-a)** 15%
 - b) The probability the person is smoker **2-b)** ?
 - c) The probability the person is smoker and have cancer **2-c)** 10%
 - d) The probability the person is smoker or have cancer **2-d)** ?
 - e) The probability the person has not cancer and is not a smoker **2-e)** 55%
 - f) The probability the person has not cancer or is not a smoker **2-f)** ?
 - g) The probability the person has not cancer or is a smoker **2-g)** 95%
 - h) The probability the person has cancer or not **2-h)** ?
- 3) At a convention there are 7 math instructors, 5 computer science instructors, 3 statistics instructors and 4 science instructors. If an instructor is selected at random, find the probability of selecting a math or science instructor.**

3) 58%

- 4) In a statistics class there are 18 juniors and 10 seniors; 6 of the seniors are females and 12 of the juniors are males. If a student is selected at random, find the probability of selecting the following:

	Juniors	Seniors	
Female	12	6	18
Male	6	4	10
	18	10	28

- a) P(a junior or a female) **4-a)** 86 %
- b) P(a senior or a female) **4-b)** 78 %
- c) P(a junior or a senior) **4-c)** ?

- 5) A grocery store employs cashiers, stock clerks, and deli personnel. The distribution of employees according to marital status is shown here

	Cashier	Stock Clerk	Deli personnel	
Married	8	12	3	23
Not Married	5	15	2	22
	13	27	5	45

If an employee is selected at random, find the following probabilities:

- a) The employee is a stock clerk or married. **5-a)** 84 %
- b) The employee is not married **5-b)** 49 %
- c) The employee is a cashier or is not married **5-c)** 67 %
- 6)
- a) Find ${}_6P_4 \times {}_7C_5 =$ **6-a)** 7,560
- b) Find ${}_5P_2 \times {}_5C_2 =$ **6-b)** 200
- c) Find ${}_5P_0 \times {}_5C_0 =$ **6-c)** 1
- d) In how many ways Moe can dress up, if he has 10 shirts, 5 pants, and 4 pair of shoes? **6-d)** 200
- e) How many different 3-letter words can be written not ending with letters (f,i,g,h,t,e,r)? **6-e)** 12,844
- f) If a password should consist of 2 letters first and 3 digits after, then how many different passwords are possible? **6-f)** 676,000
- g) How many ways can a president and a treasurer be selected in a club of 10 members? **6-g)** 90
- h) In how many ways can we select 3- member committee from a group of 8 people? **6-h)** 56
- i) How many ways can a president, vice-president, and a treasurer be selected in a club with 12 members? **6-i)** 1,320
- j) In how many ways a teacher can select 5 of his 23 students for a fieldtrip? **6-j)** 33,649

W			
L			
			\$0

11) On a multiple-choice test, a student is given four possible answers for each question. The student receives 1 point for a correct answer and loses $\frac{1}{4}$ point for an incorrect answer. If the student has no idea of the correct answer for a particular question and merely guesses, what is the student's expected gain or loss on the question? **11) 0.0625**

Correct			
Incorrect			
			0.0625

12) Suppose also that on one of the questions you can eliminate two of the four answers as being wrong. If you guess at one of the remaining three answers, what is your expected gain or loss on the question? What is your expected value? **12) 0.375**

Correct			
Incorrect			
			0.375

13) A contractor is considering a sale that promises a revenue of \$38,000 with a probability of 0.7 or a loss (due to bad weather, strikes, and such) of \$18,000 with a probability of 0.3. What is the expected profit? **13) \$8,600**

Profit			
Loss			
			\$8,600

14) Suppose that you want to insure a laptop computer, an iPhone, a trail bike, and your text-books. Table gives the values of these items and the probabilities that these items will be stolen over the next year.

	Value	Probability of being stolen	
Laptop	\$2000	2%	\$40
iPhone	\$600	3%	\$18
Trail bike	\$700	1%	\$7
Text Books	\$800	4%	\$32

- a) Predict what the insurance company can expect to pay in claims on your policy. **\$97**
 b) Is \$100 a fair premium for this policy? **Yes**