

Question 6 : (9 Points)

A survey was made to study the students' opinion about evening classes. The results are summarized in the following table:

Opinion Level	Highly agree	Agree	Disagree	Highly disagree	Total
Freshman	45	60	135	65	305
Sophomore	28	15	55	25	123
Junior	17	10	30	15	72
Total	90	85	220	105	500

If one student is selected at random, find the following

- a. What is the probability that he student is a junior or disagrees?(3 points)

Let J: The student is junior D: The student disagrees.

$$P(J \cup D) = P(J) + P(D) - P(J \cap D) \quad \textcircled{1}$$

$$= \frac{72}{500} + \frac{220}{500} - \frac{30}{500} = \frac{131}{250}$$

$$= 0.524. \quad \textcircled{2}$$

- b. What are the odds of the event E: the student is freshman and highly agrees?(3 points)

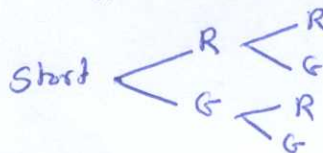
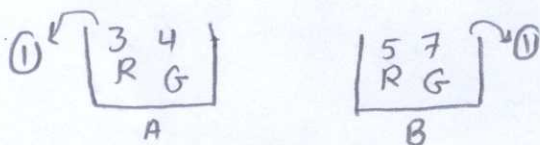
$$P(E) = \frac{45}{500} = \frac{9}{100} = 0.09 \quad \textcircled{1}$$

$$P(E') = 1 - P(E) = 1 - 0.09 = 0.91 \quad \textcircled{1}$$

$$\text{The odds} = \frac{P(E)}{P(E')} = \frac{0.09}{0.91} = \frac{9}{91} \text{ or } 9:91 \quad \textcircled{1}$$

- c. Two boxes A and B, if A contains three red and four green balls, B contains five red and seven green balls. One ball is selected at random from each box,

I. Write the sample space.(1 point)



$$\Rightarrow S = \{RR, RG, GR, GG\} \quad \textcircled{1}$$

- II. What is the probability of getting one red ball and one green ball? (2 points)

Let $E = \{ \text{one red ball and one green ball} \}$

$$= \{RG, GR\} \quad \textcircled{1}$$

$$P(E) = P(RG) + P(GR)$$

$$= \left(\frac{3}{7}\right)\left(\frac{7}{12}\right) + \left(\frac{4}{7}\right)\left(\frac{5}{12}\right)$$

$$= \frac{1}{4} + \frac{5}{21} = \frac{41}{84}$$

$$= 0.4881 \quad \textcircled{1}$$