

Insurance companies routinely make calculations about anticipated expenditures for illness with which their subscribers may be diagnosed. The following is a summary table with information about costs (K=1,000) of three illnesses. The human resources department of a large manufacturing firm is interested in calculating insurance premium costs per individual using this data. Use this information to answer the next **three** questions. Note: the answers were calculated by leaving the numbers in terms of thousands.

Illness	P(X)	E(X)	V(X)
Heart Disease	0.37	50K	289K
Colon Cancer	0.19	33K	121K
Asthma	0.11	56K	361K

- What is the expected cost of these three illnesses per employee?
  - 11.8K
  - 30.9K
  - 46.3K
  - 74.5K
- Assuming that the three illnesses are independent of one another, what is the expected standard deviation of the cost of these three illnesses per employee?
  - 6.95K
  - 10.5K
  - 13.0K
  - 48.3K
- Johns Hopkins Medical Center has determined that persons with asthma have an increased likelihood of developing heart disease. How would this information affect the standard deviation calculated in the previous question?
  - Insufficient information to predict any change.
  - It would not change it.
  - It would decrease it.
  - It would increase it.

Mike, the manager at the digital camera counter at BestBuy in Bloomington is trying to get a clear picture of the sales of his most popular items so that he can make a case for an increased budget for these items to his regional manager. Over the past month, Mike has collected sales information for his top three items, which is summarized and recorded in the table below. The sales information is in number of each item sold in a two-week period. Use this information to answer the following ***THREE*** questions.

Item	Price Each	Mean Sales	Standard Deviation of Sales
Canon SD450	\$350	50	8
Kodak V530	\$250	56	10
Sony DSC-P200	\$300	45	9

4. What revenue does Mike expect from these three items in a two-week period, rounded to the nearest whole dollar?
  - A. \$45000
  - B. \$32000
  - C. \$24000
  - D. \$8000
  
5. Assuming that the sales of each item are independent of the other two, what is the standard deviation of the revenue from these three items in a two-week period, rounded to the nearest whole dollar?
  - A. \$21380000
  - B. \$71700
  - C. \$4624
  - D. \$268
  
6. Mike has noticed that over this two-week period, the covariance of sales of Canon SD450 with sales of Sony DSC-P200 is  $-36$ . How will this information affect the variance calculated in the previous question (so you could get the standard deviation)?
  - A. decrease it by 7560000
  - B. decrease it by 3780000
  - C. increase it by 2749.545
  - D. increase it by

Answers:

- 1 B
- 2 A
- 3 D
- 4 A
- 5 C
- 6 A