

STATISTICS & PROBABILITY (PAPER 3)

02 SEPTEMBER 2013

Lesson Description

In this lesson, we:

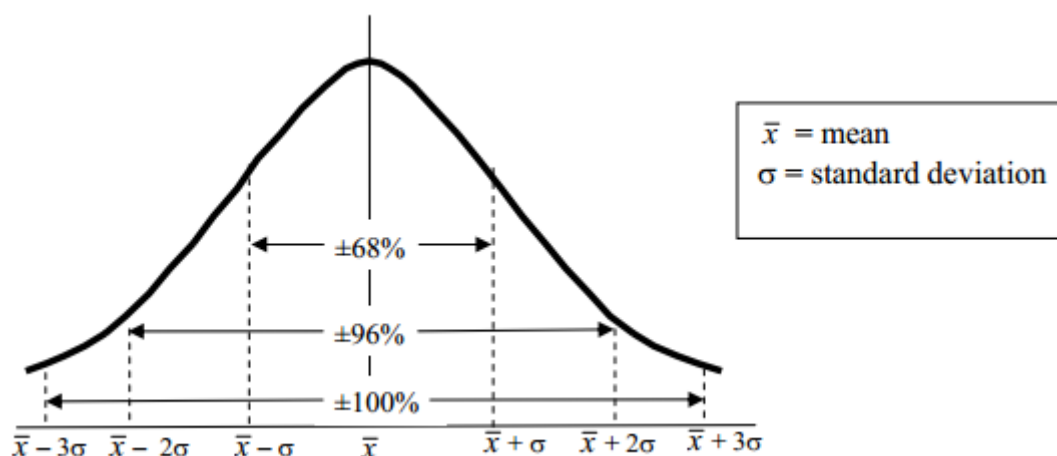
- Look at typical exam questions relating to Paper 3 Statistics & Probability.

Questions

Question 1

(Adapted from DBE, Nov 2011 Paper 3, Question 4)

The time taken for a pizza outlet to deliver to a customer is recorded. The data is found to be normally distributed with a mean time of 24 minutes and a standard deviation of 3 minutes.



Answer the following questions with reference to the information provided in the graph.

- What percentage of pizzas are delivered between 21 and 24 minutes? (2)
- What percentage of pizzas are delivered between 15 and 27 minutes? (3)
- The outlet advertises that they will not charge for a pizza that takes longer than a certain time to deliver. If they want to give away no more than 2% of all deliveries, how many minutes should they allow for delivery? (3)

[8]

Question 2

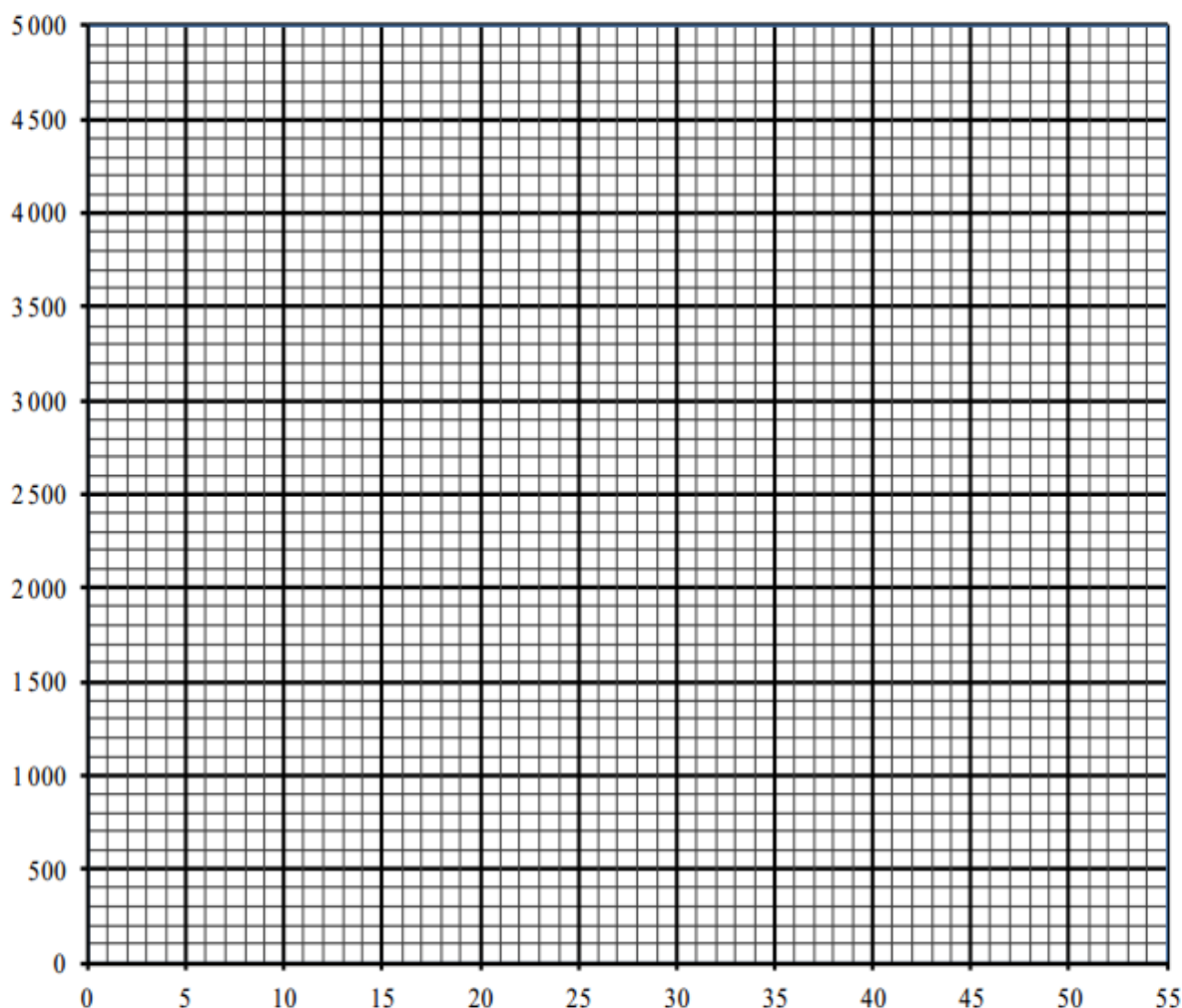
(Adapted from DBE, Nov 2012, Paper 3, Question 1)

A recording company investigates the relationship between the number of times a CD is played by a national radio station and the national sales of the same CD in the following week. The data below was collected for a random sample of 10 CDs. The sales figures are rounded to the nearest 50.

Number of times CD is played	47	34	40	34	33	50	28	53	25	46
Weekly sales of the CD	3 950	2 500	3 700	2 800	2 900	3 750	2 300	4 400	2 200	3 400

- a.) Identify the independent variable. (1)
 b.) Draw a scatter plot of this data on the grid provided below. (3)

**Scatter plot showing the number of times a CD was played
 vs the CD sales in the following week**



- c.) Determine the equation of the least squares regression line. (4)
 d.) Calculate the correlation coefficient. (2)
 e.) Predict, correct to the nearest 50, the weekly sales for a CD that was played 45 times by the radio station in the previous week. (2)
 f.) Comment on the strength of the relationship between the variables. (1)
[13]

Question 3

(Adapted from DBE, Nov 2011, Paper 3, Question 3)

Let A and B be two events in a sample space. Suppose that $P(A) = 0,4$; $P(A \text{ or } B) = 0,7$ and $P(B) = k$.

- a.) For what value of k are A and B mutually exclusive? (2)
 b.) For what value of k are A and B independent? (4)
[6]

Question 4

(Adapted from DBE, Nov 2011, Paper 3, Question 5)

The digits 0, 1, 2, 3, 4, 5 and 6 are used to make 3 digit codes.

- a.) How many unique codes are possible if digits can be repeated? (2)
 - b.) How many unique codes are possible if the digits cannot be repeated? (2)
 - c.) In the case where digits may be repeated, how many codes are numbers that are greater than 300 and exactly divisible by 5? (3)
- [7]

Question 5

(Adapted from DBE, Nov 2011, Paper 3, Question 6)

Complaints about a restaurant fell into three main categories: the menu (M), the food (F) and the service (S). In total 173 complaints were received in a certain month. The complaints were as follows:

- 110 complained about the menu.
 - 55 complained about the food.
 - 67 complained about the service.
 - 20 complained about the menu and the food, but not the service.
 - 11 complained about the menu and the service, but not the food.
 - 16 complained about the food and the service, but not the menu.
 - The number who complained about all three is unknown.
- a.) Draw a Venn diagram to illustrate the above information. (6)
 - b.) Determine the number of people who complained about ALL THREE categories. (3)
 - c.) Determine the probability that a complaint selected at random from those received, complained about AT LEAST TWO of the categories (that is. menu, food and service). (3)
- [12]

Question 6

(Adapted from DBE, Nov 2012, Paper 3, Question 4)

During summer in a certain city in South Africa the probability of a sunny day is $\frac{4}{7}$ and the probability of a rainy day is $\frac{3}{7}$

- If it is a sunny day, then the probability that Vusi cycles to work is $\frac{7}{10}$, the probability that Vusi drives to work is $\frac{1}{5}$ and the probability that Vusi takes the train to work is $\frac{1}{10}$.
- If it is a rainy day, then the probability that Vusi cycles to work is $\frac{1}{9}$, the probability that Vusi drives to work is $\frac{5}{9}$ and the probability that Vusi takes the train to work is $\frac{1}{3}$.

- a.) Draw a tree diagram to represent the above information. Indicate on your diagram the probabilities associated with each branch as well as all the outcomes. (5)
- b.) For a day selected at random, what is the probability that:
- i. It is rainy and Vusi will cycle to work (2)
 - ii. Vusi takes the train to work (3)
- c.) If Vusi works 245 days in a year, on approximately how many occasions does he drive to work? (4)
- [14]**