

You should be able to answer Questions 1 and 2 after you have studied Unit 6.

You should be able to answer Questions 3 and 4 after you have studied Unit 7. You will need to use Minitab to answer Question 4.

You should be able to answer Questions 5 and 6 after you have studied Unit 8. You will need to use Minitab to answer Question 6.

You should be able to answer Questions 7 and 8 after you have studied Unit 9. You will need to use Minitab to answer Questions 7 and 8.

**Question 1** (Unit 6) – 13 marks

Our friend Deepika needs some winter clothing, so she goes to her local clothing store to see what choices they have. Looking around the store, she sees that they have two types of winter items: coats and sweaters, but can't decide which one to get among the two. There are also choices of different colours within each type. She counts the number of items they have for each type and colour that are in her size. The numbers are shown in Table 1. Unfortunately the store doesn't have a beige sweater in her size.

**Table 1**

Type	Colour				Total
	White	Beige	Navy blue	Black	
Coat	4	1	2	6	
Sweater	3	0	3	5	
Total					

- (a) Calculate the row, column, and overall totals for Table 1, presenting them as part of the table. [3]
- (b) As Deepika can't decide which item to buy, she calls her friend Ameena for suggestions. But Ameena, being a statistician, tells her to pick one item entirely at random. Suppose Deepika agrees to her advice and decides to pick one item randomly among all the different items available.
- (i) Calculate the probability that she selected a sweater. [2]
- (ii) Using the probability rule for complementary events, calculate the probability that the selected item isn't a black coat. [2]
- (iii) Calculate the probability that the selected item is dark coloured. [3]
- (c) During their phone call, Ameena realises that she also needs something for the winter. So she comes down to the store, where Deepika is waiting for her, and plans to pick an item exactly the same way, by choosing randomly among the available options. The two friends have the same size, and they decide to make the random draw at the same time, but independently.
- Calculate the probability that they both pick the same type of item, regardless of colour. [3]

Hint: first show that the probability of them both picking sweaters is 0.21 (rounded to two decimal places). In a similar way, calculate the probability of them both picking coats. Using these two numbers, calculate the probability in question.