Mixed Probability Formula Questions

1 28 students go tramping. 23 get sunburn, 8 get blisters, and 5 get both sunburn and blisters. Determine the probability that a randomly selected student:

a did not get blisters

b either got blisters or sunburn

c neither got blisters nor sunburn

d got blisters, given that the student was sunburnt

e was sunburnt, given that the student did not get blisters.

2 Marius has 2 bags of peaches. Bag A has 4 ripe and 2 unripe peaches, and bag B has 5 ripe and 1 unripe peaches. Ingrid selects a bag by tossing a coin, and takes a peach from that bag.

a Determine the probability that the peach is ripe.

b Given that the peach is ripe, what is the probability it came from B?

3 Janice and Lee take set shots at a netball goal from 3 m. From past experience, Janice throws a goal on average 2 times in every 3 shots, whereas Lee throws a goal 4 times in every 7. If they both shoot for goals, determine the probability that:

a both score a goal

b both miss

c Janice goals but Lee misses.

4 A pair of dice is rolled.
Hence, determine the probability of a result with:

i one die showing a 4 and the other a 5

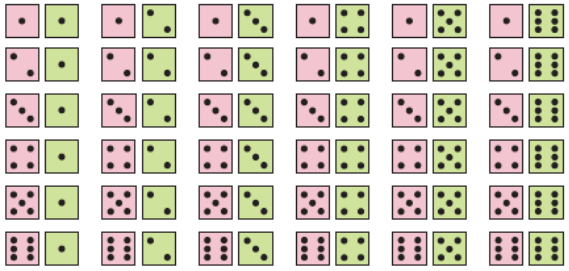
ii both dice showing the same result

iii at least one of the dice showing a result of 3

iv either a 4 or 6 being displayed

v both dice showing even numbers

vi the sum of the values being 7.



5 A spinner with 6 equal sides has 3 red, 2 blue and 1 yellow edge. A second spinner with 7 equal sides has 4 purple and 3 green edges. Both spinners are twirled simultaneously. Find the probability of getting:

a a red and a green **b** a blue and a purple.

6 50 students went on a 'thrill seekers' holiday. 40 went white-water rafting, 21 went paragliding, and each student did at least one of these activities.

a From a Venn diagram, find how many students did both activities.

b If a student from this group is randomly selected, find the probability that he or she:

i went white-water rafting but not paragliding

ii went paragliding given that he or she went white-water rafting.

7 The medical records for a class of 28 children show whether they had previously had measles or mumps. The records show 22 have had measles, 13 have had measles and mumps, and 27 have had measles or mumps. If one child from the class is selected at random, determine the probability that he or she has had:

a measles **b** mumps but not measles **c** neither mumps nor measles.

8 In a small country there are 3 supermarkets: P, Q and R. 60% of the population shop at P, 36% shop at Q, 34% shop at R, 18% shop at P and Q, 15% shop at P and R, 4% shop at Q and R, and 2% shop at all 3 supermarkets. A person is selected at random. Determine the probability that the person shops at:

a none of the supermarkets **b** at least one of the supermarkets

c exactly one of the supermarkets **d** either P or Q

e P, given that the person shops at at least one supermarket

f R, given that the person shops at either P or Q or both.

9 When Sophia goes to the local shopping centre from Monday to Thursday, the probability that she finds a car park is 95%. When she goes on Friday or Saturday, the probability of finding a car park is 70%. Assuming that she is equally likely to shop on any day from Monday to Saturday, determine the probability that:

a she finds a car park **b** it is Saturday, given that she finds a car park.

Answers

1 **a** $\frac{5}{7}$ **b** $\frac{13}{14}$ **c** $\frac{1}{14}$ **d** $\frac{5}{23}$ **e** $\frac{9}{10}$

2 **a** $\frac{3}{4}$ **b** $\frac{5}{9}$

3 **a** $\frac{8}{21}$ **b** $\frac{1}{7}$ **c** $\frac{2}{7}$

4 **i** $\frac{1}{18}$ **ii** $\frac{1}{6}$ **iii** $\frac{11}{36}$ **iv** $\frac{5}{9}$ **v** $\frac{1}{4}$ **vi** $\frac{1}{6}$

5 **a** $\frac{3}{14}$ **b** $\frac{4}{21}$

6 **a** 11 **b** **i** $\frac{29}{50}$ **ii** $\frac{11}{40}$

7 **a** $\frac{11}{14}$ **b** $\frac{5}{28}$ **c** $\frac{1}{28}$

8 **a** $\frac{1}{20}$ **b** $\frac{19}{20}$ **c** $\frac{31}{50}$ **d** $\frac{39}{50}$ **e** $\frac{12}{19}$ **f** $\frac{17}{78}$

9 **a** $\frac{13}{15}$ **b** $\frac{7}{52}$