PROBABILITY

tree diagrams - exercises

THE FUNDAMENTAL COUNTING PRINCIPLE

1 You are at a carnival. One of the carnival games asks you to pick a door and then pick a curtain behind the door.
There are 3 doors and 4 curtains behind each door.
How many choices are possible for the player?

2 Jay owns 3 surfboards and 2 wetsuits.
If he takes one surfboard and one wetsuit to the beach, how many different combinations can he choose?

3 To purchase a lottery ticket, you must select 4 numbers from 0 to 9.
How many possible lottery tickets can be chosen?

4 To purchase a lottery ticket, you must select 4 different numbers from 0 to 9.
How many possible lottery tickets can be chosen?

5 There are 3 trails leading to camp A from your starting position. There are 2 trails from camp A to camp B.
How many different routes are there from the starting position to camp B? Draw a tree diagram to illustrate your answer.

PROBABILITY OF COMPOUND EVENTS

6 If three coins are tossed, what is the probability of getting exactly two Heads?

When three coins are tossed, the occurrence of heads or tails on one of the coins does not affect the occurrence of heads or tails on the other coins. When one coin is tossed three times, the occurrence of heads or tails on one toss will not affect the occurrence of heads or tails on another toss. Therefore, tossing three coins at the same time produces the same outcomes as tossing one coin three times.

7 If three coins are tossed, what is the probability of getting at most two Heads?

8 One drawer contains 2 blue socks and 7 purple socks. A second drawer contains 3 blue socks and 2 yellow socks. A sock is chosen at random from each drawer.

1) What is the probability of getting two blue socks?
2) What is the probability of getting blue at least once?
3) What is the probability of getting two socks of different colours?
4) What is the probability of getting two socks of the same colour?

9 A spinner has 1 orange section and 4 pink sections (all equal). It is spun twice.

What is the probability of getting orange twice?
What is the probability of not getting orange twice?
What is the probability of getting the same colour twice?
What is the probability of getting different colours?

10 Bill, Raul and Joe are in a bicycle race. If each boy has an equal chance of winning, find each probability:

1) Joe wins the race.
2) Raul finishes last.
3) Joe, Raul and Bill finish first, second and third, respectively.

11 Mr T has three children: 2 girls and 1 boy. After each meal, one child is chosen at random to do the washing-up.

1) If the same child can be chosen for both lunch and dinner, list a sample space of all the possible outcomes of who will do the washing-up after lunch and dinner on Saturday.
2) Same question if the same child cannot be chosen the same day.
3) What is the probability of the event "The boy won't do the washing-up on Saturday" in each case?

remark: to do the washing-up -> GB
to do the dishes -> US