

Module 3 – Activities & Problems

3.1 Tree Diagrams

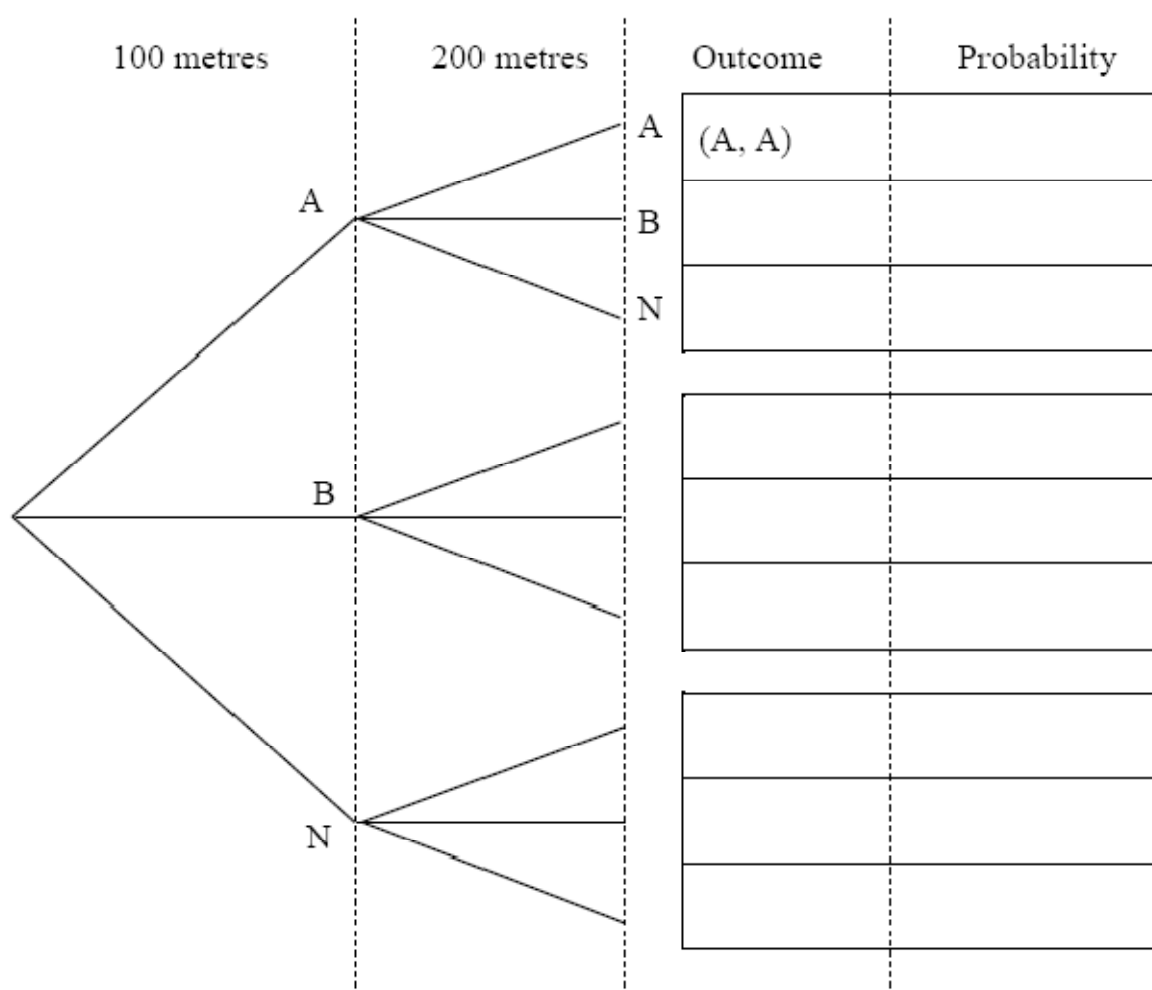
Alex and Bobby are running in the final of a 100 metre race and a 200 metre race.

The probabilities of each of them winning each race are given in the table below.

The probability that neither of them wins the 100 metre race is also given.

	Alex	Bobby	Neither
100 metre race	$\frac{1}{6}$	$\frac{1}{4}$	$\frac{7}{12}$
200 metre race	$\frac{1}{4}$	$\frac{3}{8}$	

- (i) Complete the table above, by inserting the probability that someone other than Alex or Bobby wins the 200 metre race.
- (ii) Using the tree diagram, or otherwise, complete the list of outcomes below. For example, the outcome that Alex wins the first race and the second race is recorded as (A, A), as shown. Write the probability of each outcome in the space beside it.



- (iii) What is the probability that Alex and Bobby win a race each?
[NCCA Pre, OL, Q7(b) 2010]

3.2 Tree Diagrams

Three eggs are selected from a dozen eggs. Three of the eggs are bad.

- (i) Draw a tree diagram to represent this situation.
- (ii) Find the probability of selecting two bad eggs in the selection.

3.3 Set Diagrams

In a certain street $\frac{1}{5}$ of the households have no newspaper delivered, $\frac{1}{2}$ have a national paper delivered and $\frac{1}{3}$ have a

local paper delivered. Draw a Venn diagram to represent this.

If a household is selected at random find the probability that it will have both papers delivered.

3.4 Set Diagrams

In a class of 30 pupils, 12 got an A grade in Maths, 8 got an A grade in Biology and 8 got an A grade in French. 3 got A grades in Maths and Biology. 3 got A grades in Maths and French. 4 got A grades in Biology and French. 2 students got A grades in all three of the above subjects.

- (i) Draw a Venn diagram to represent the above data.
- (ii) One student is chosen at random. Find the probability that they have an A grade in
 - (a) at least one of the three subjects
 - (b) only one of the three subjects
 - (c) French but not Biology.

3.5 Counting Method

What is the probability of choosing 2 red cards and 1 black card from a pack of 52 cards?
Use the Counting Method and the Non Counting Method.
Use a tree diagram to show the sample space.

3.6 Counting Method

Probability of getting 4 kings and 1 Queen in a hand of 5 cards.
Use the Counting Method and the Non Counting Method.

3.7 Lotto

What is the probability of getting 4 of the winning numbers plus the bonus ball in the National Lottery? Note there are 45 ball in the National Lotto.