

Task 1 : Sample space diagrams

Task 2 : Tree diagrams – independent events

Task 3 : Tree diagrams – dependent events

Task 4 : Venn diagrams

Help and Hints.....

Probability (2)

Task 1

Work out the values for all of the cells in the table
 All of the outcomes are equally likely
 Count up how many of the values meet the condition

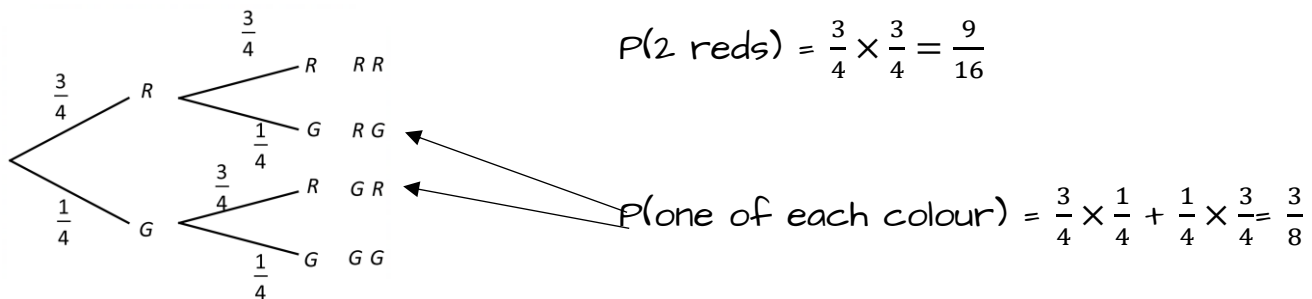
+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

36 outcomes

$$P(8) = \frac{5}{36}$$

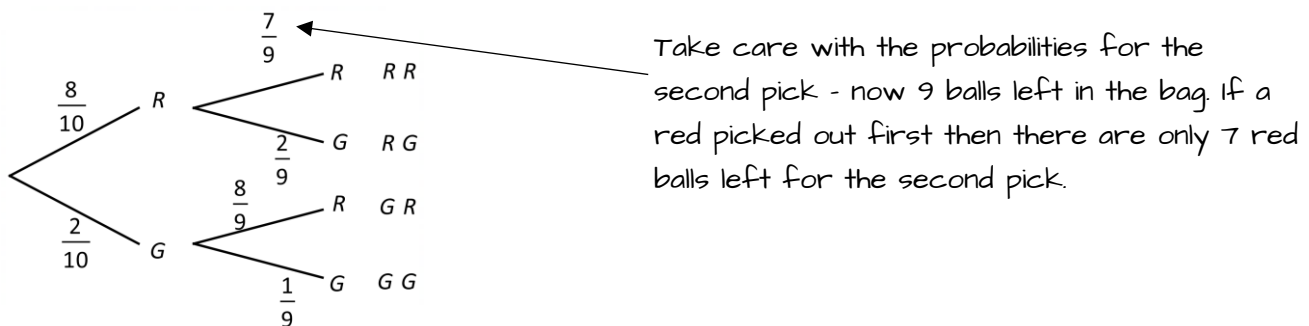
Task 2

A bag contains 3 red and 1 green ball. A ball is picked at random, the colour noted and then replaced before second ball is picked



Task 3

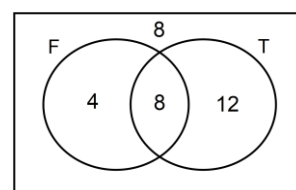
A bag contains 8 red and 2 blue balls. Two balls are selected at random



Task 4

In a class there are 8 students who play tennis and football, 8 students who do not play tennis or football, 12 students who play tennis and 20 students who play football. Find the probability that a student chosen at random plays both sports

Show the information as a Venn diagram and use this to calculate the total number of students (32)



$$P(\text{Plays both}) = \frac{8}{32} = \frac{1}{4}$$

TASK 1

1 Two ordinary dice are rolled and the difference between the scores noted

	1	2	3	4	5	6
1	0					
2						
3		1				
4						2
5						
6			3			

- What is the probability of getting a difference of 0?
- What is the probability of getting a difference of greater than 2?
- What is the probability of getting a difference less than 4?

2 Two dice are rolled and the sum of the scores noted. The dice are numbered 3, 6, 9, 12 and 2, 4, 6, 8. Complete the sample space diagram to show the possible outcomes

	3	6	9	12
2	5			
4				
6		12		
8				

- What is the probability of getting a sum of 12?
- What is the probability of getting a sum which is a multiple of 4?
- What is the probability of getting a sum less than 20?

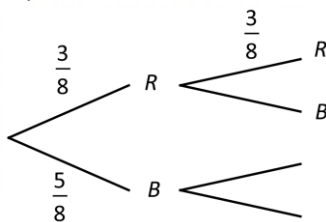
3 An ordinary die is rolled and a fair coin tossed. Complete the table to show the possible outcomes

	1	2	3	4	5	6
H	H1	H2				
T				T4		

- What is the probability of getting a tail on the coin and an odd number on the die?
- What the probability of getting a head on the coin or a 6 on the die?

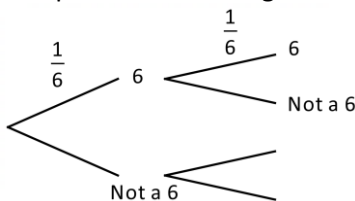
TASK 2

1 A bag contains 3 red counters and 5 blue counters. A counter is selected at random, the colour noted and replaced. A second counter is then selected. Complete the tree diagram to show the outcomes



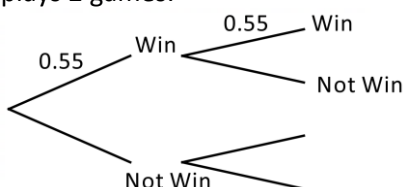
- What is the probability picking two blue counters
- What is the probability picking one of each colour?

2 A die is rolled twice and it is noted if a 6 is scored on each roll. Complete the tree diagram to show the outcomes.



- What is the probability of getting two sixes?
- What is the probability getting at least one six?

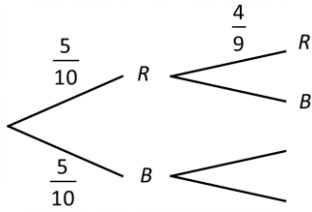
3 The probability that Hana wins a game of tennis is 0.55. Complete the tree diagram to show the outcomes if she plays 2 games.



- What is the probability that Hana wins both games?
- What is the probability that Hana wins at least one of the two games?

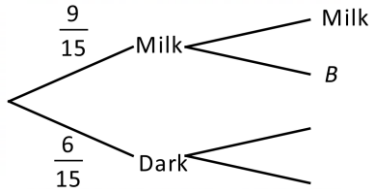
TASK 3

- 1 A bag contains 5 red counters and 5 blue counters. A counter is selected at random, the colour noted and then a second counter is selected. Complete the tree diagram to show the outcomes



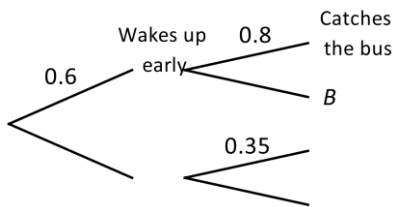
- a) What is the probability picking two red counters?
b) What is the probability picking one of each colour?

- 2 A box of chocolates contains 9 milk chocolates and 6 dark chocolates. Two chocolates are picked at random and eaten. Complete the tree diagram to show the outcomes.



- a) What is the probability getting 2 dark chocolates?
b) What is the probability getting 2 of the same type?

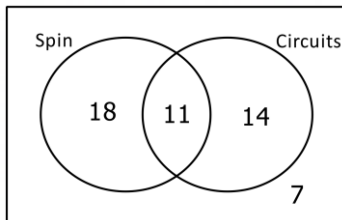
- 3 The probability that Jake wakes up early is 0.6. If Jake wakes up early the probability that he catches the 8.00am bus is 0.8, otherwise the probability that he catches the bus is 0.35. Complete the tree diagram



- a) What is the probability that he wakes up late and misses the bus?
b) What is the probability that he catches the bus?

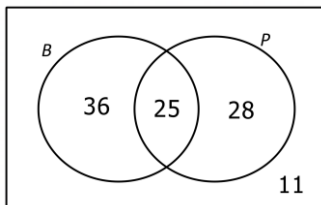
TASK 4

- 1 William surveys all 50 members of a gym to find out which class they take. His results are shown in the Venn diagram. If a member of the gym is selected at random calculate



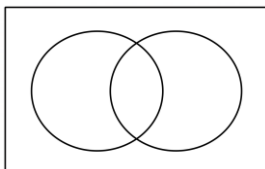
- a) $P(\text{Spin})$
b) $P(\text{Both spin and circuits})$
c) $P(\text{Just circuits})$

- 2 The Venn diagram shows information about students in Year 13.
 $B = \{\text{students who take Biology}\}$ $P = \{\text{students who take Physics}\}$
If a student is chosen at random work out :



- a) $P(B)$
b) $P(B \text{ and } P)$
c) $P(B' \text{ and } P)$

- 3 In a group of 40 students, 15 students study Art, 20 students study Maths and 2 students study both Art and Maths. Show this information as a Venn diagram.



If a student is selected at random find the probability that they don't study Maths or Art

TASK 1

- 1a $\frac{1}{6}$
1b $\frac{1}{3}$
1c $\frac{5}{6}$
2a $\frac{1}{16}$
2b $\frac{1}{4}$
2c $\frac{15}{16}$
3a $\frac{1}{4}$
3b $\frac{7}{12}$

TASK 2

- 1a $\frac{25}{64}$
1b $\frac{15}{32}$
2a $\frac{1}{36}$
2b $\frac{11}{36}$
3a 0.3025
3b 0.7975

TASK 3

- 1a $\frac{2}{9}$
1b $\frac{5}{9}$
2a $\frac{1}{7}$
2b $\frac{17}{35}$
3a 0.26
3b 0.62

TASK 4

- 1a $\frac{29}{50}$
1b $\frac{11}{50}$
1c $\frac{7}{25}$
2a 0.61
2b 0.25
2c 0.28
3 $\frac{7}{40}$