Probability

GCSE Worksheet

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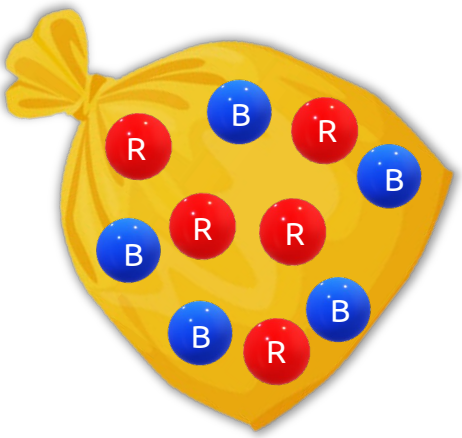
Grade 3-4 questions

1 John takes part in two games. The probability of him loosing in both is 0.3. Calculate the probability of winning in at least 1.

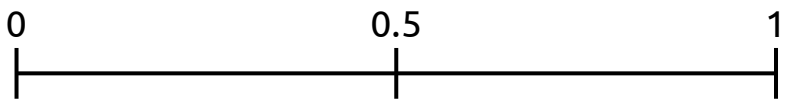
..... (1)

2 A bag has 10 counters, shown below. The counters are either red or blue. Alan takes two counters randomly from the bag.



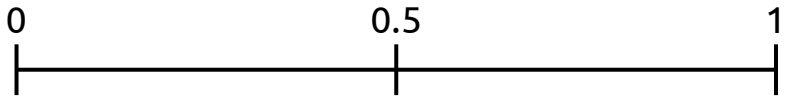
Mark on each probability scale, with an **X**, the **rough** probability of.

a. Taking 2 red counters.



(1)

b. Taking one of each color.



(1)

Grade 4-5 questions

3 Anita spins a **biased** spinner. It can land on red, blue, green, yellow or orange.

The table below shows the probabilities of the spinner landing on each of the colors.

Color	Red	Blue	Green	Yellow	Orange
Probability	x	0.05	$2x$	0.15	x

a. Calculate the value of x.

Anita spins the spinner 300 times. ..... (3)

b. Work out the expected number of times it will land on green.

..... (2)

Unexpectedly, the spinner lands on blue 54 times.

c. Based on this experiment, work out the probability of landing on blue.

..... (1)

4 Yusef choses a random number between 1 and 4 (both inclusive).

Jake choses a number between 8 and 11 (both inclusive).

Sofia multiplies the two numbers.

a. Complete the sample space diagram with all the expected outcomes.

	1	2	3	4
8				
9				
10				
11				

b. Work out the probability that the result is a number higher than 21.

..... (2)

5 Mohamed flips a coin, and John rolls a dice.

a. Complete the sample space diagram with all the expected outcomes.

	1	2	3	4	5	6
H						
T						

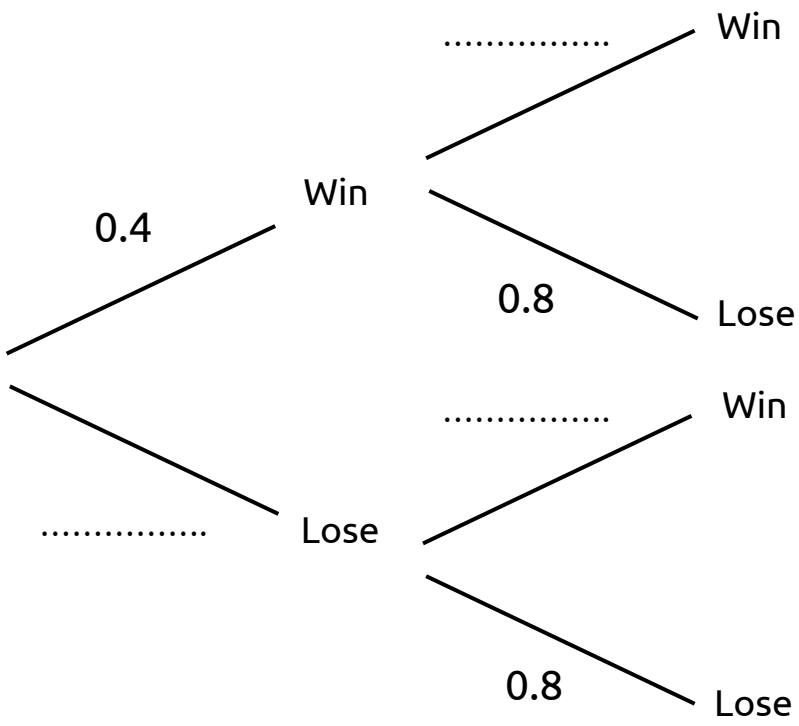
b. Work out the probability of getting a heads and a number higher than 4.

..... (2)

Grade 5-6 questions

6 Sam takes place in two races. He has a probability of 0.4 of winning the first race. The probability of him losing the second race is 0.8.

a. Complete the probability tree.



(3)

b. Calculate the following probabilities.

i. Winning both races.

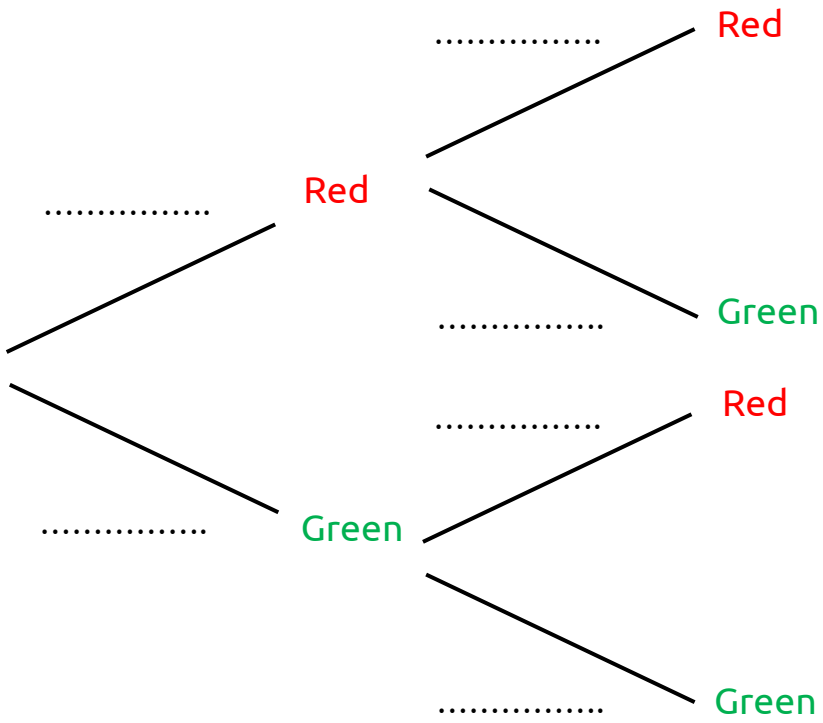
..... (1)

ii. Winning **at least** 1 race.

..... (2)

7 David has a bag of 5 red marbles and 8 green marbles. He takes one out and **does not** replace it. He then takes another one out.

a. Complete the probability tree.



(6)

b. Calculate the following probabilities.

i. Taking two counters of the same color.

..... (2)

ii. Taking two counters of different colors.

..... (2)

8 There are 4 milk chocolates, 5 white chocolates and 1 dark chocolates in a bag. Fatima randomly takes 2.

a. Draw a probability tree.

(4)

b. Calculate the following probabilities.

i. Two of the same type of chocolate.

..... (3)

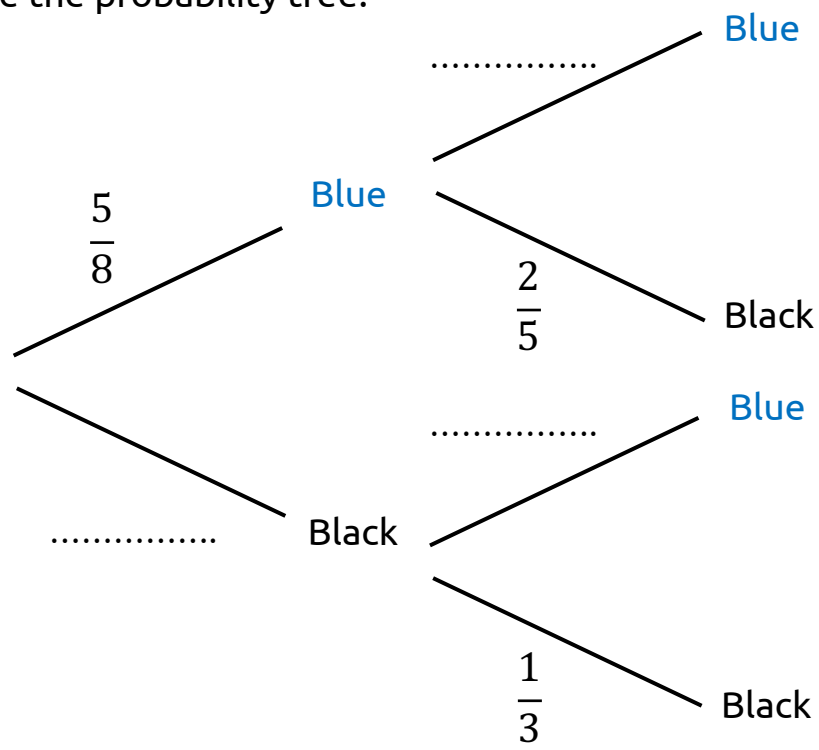
ii. At least 1 milk chocolate.

..... (2)

Grade 6-7 questions

9 Emily has a box of blue and black pens. She randomly takes two out of the box. Some probabilities are shown in the tree below.

a. Complete the probability tree.



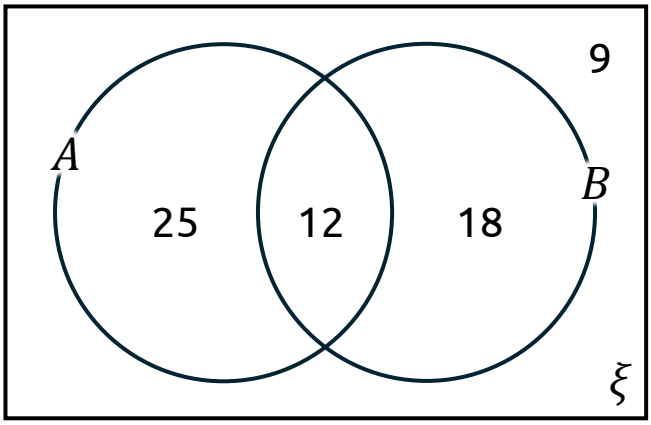
(3)

b. Calculate the probability that the two pens are not of the same color.

c. Calculate the total number of pens ..... (3)

..... (3)

10 The numbers on the venn diagram below show the number of elements in each section of the diagram.



a. Calculate the value of:

i. $P(A)'$

ii. $P(A \cap B')$ ..... (2)

iii. $P((A \cup B)')$ ..... (2)

..... (3)

b. If an element is in $(A \cap B)'$ calculate the probability that is it also in $(B \cap A'))$

..... (3)

11 Choose true or false for the following statements.

__Note:__ as a grade 6+ student, you __must__ thoroughly understand key concepts and terms.

	True	False
a. $P(A \cap B) = 0$ implies that A and B are mutually exlusive.	◯	◯
b. If A and B overlap, $P(A \cup B) = P(A) + P(B)$	◯	◯
c. If all elements of set A are in set B, then, $A \in B$	◯	◯
d. If $A \in B$, then $P(A) > P(B)$	◯	◯

(4)

12 In a group of 100 people, 30 like pineapples, 80 like apples and some like neither.

If a person who likes pineapples is chosen randomly, the probability that they don't like apples is $\frac{2}{5}$.

How many people like neither?

..... (4)

Grade 7+ questions

13 There are x marbles in a bag, where $x < 15$.

7 are blue, the rest are red.

Ben randomly takes 1 marble and keeps it. He then randomly takes another marble.

The probability that both marbles are of the same color is $\frac{8}{15}$.

Calculate the value of x.

..... (5)

14 The cards in a deck each have one number on them, as shown below.

10	23	41	12	10	x

Kyran takes a card and does not replace it. Megan then takes a card and keeps it. Finally, Moaz takes a card out.

The probability that the sum of the numbers on the three cards is an odd number is $\frac{3}{5}$.

Using probability, show that x is an even number.

..... (4)

15 In a bag, there are x candies, which are either green, red or blue.

5 of the candies are green. There are y blue candies.

There are twice as many red candies as blue candies.

Adarsh takes a candy out and doesn't replace it. He then takes another candy out.

The probability that he takes out 2 candies of the same color is $\frac{4}{13}$.

Calculate the value of x.

..... (6)

16 A box has 25 fruits: apples and bananas, where there are more apples than bananas.

Zuni takes out one fruit and keeps it. She then takes out another fruit.

The probability of her taking out 2 fruits of different colors is $\frac{77}{150}$.

If 2 more apples and 3 more bananas are added to the box, calculate the probability of taking 2 fruits of the same color.

..... (6)