High School Mathematics Test 2013

Year 7

Sample Space and Probability

Non Calculator Section

Skills and Knowledge Assessed:

- Construct sample spaces for single- step experiments with equally likely outcomes (ACMSP167)
- Assign probabilities to the outcomes of events and determine probabilities for events (ACMSP168)

Name_____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper.

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1. Josie had 5 T shirts of different colours, red, white, blue, green and purple in her bag when she was travelling.
   Complete the **sample space** in the spaces below, for the question:
   "What is the probability that when Josie chooses a T shirt at random from her bag, it is a red T shirt"

	Red T Shirt	

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2. Are the outcomes equally likely for the experiment in question 1?

   ☐ Yes they are ☐ No they aren't

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3. Complete the **sample space** in the spaces below, for the question:
   What is the probability that a person chosen at random has 2 siblings?

No Siblings			
			More than 5 Siblings.

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4. Are the outcomes equally likely for the experiment in question 3?

   ☐ Yes they are ☐ No they aren't

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5. At her birthday party, Hannah had as guests, her two brothers and three sisters, four male cousins and three female cousins, seven male friends and eleven female friends.
She gave a prize to one of her guests selected at random.
Which statement is true?

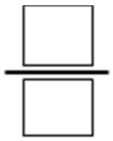
- ☐ A relative was more likely to win than a friend.
- ☐ A male was more likely to win than a female.
- ☐ A cousin is more likely to win than a sibling (brother or sister).
- ☐ Male relatives and female relatives were equally likely to win.

6. Josh has the numbers of fifteen friends saved on his phone.
Six of the friends are male
Josh randomly rings one of these friends.
Which of the two statements below is true?

Statement 1 : Each friend has an equal chance of being rung.
Statement 2 : Josh is more likely to ring a female friend than a male.

- ☐ Only Statement 1 is true.
- ☐ Only Statement 2 is true.
- ☐ Both Statements are true.
- ☐ Neither Statement is true.

7. Jarmila is a tennis player and has 7 racquets in her bag which are coloured red, white, blue, green, yellow, pink and orange.
She randomly chooses a racquet from the bag.
What is the probability that it is pink or orange?



8. A city has a population of around 4 million people.
If you walked through the city in the middle of the day, the probability that you would see at least one person is closest to:

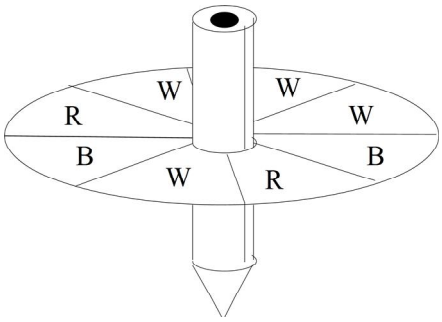
- ☐ 0.04
- ☐ 0.44
- ☐ 0.64
- ☐ 0.99

9. Which of these would have a probability closest to 0.5?

- ☐ It will rain in the desert on a day chosen at random.
- ☐ A child chosen at random is a boy.
- ☐ An advertisement will be showing when you turn the TV on at a time chosen at random.
- ☐ A car will be crossing a busy intersection at a time chosen at random.

Questions 10 – 13 refer to the **experiment** below.

10. A spinner in a game has eight equal sized sections which are coloured red (R), white (W) or blue (B) as shown in the diagram below.
Complete the table to summarise the **sample space**, for the question:
When the spinner is spun, what is the probability that it will stop with a blue sector?



Colour	Number of Sectors
Blue	
Red	
White	

11. What is the probability that the spinner will touch on Blue?

☐ $\frac{1}{4}$ ☐ $\frac{3}{8}$ ☐ $\frac{3}{4}$ ☐ $\frac{5}{8}$

12. What is the probability that the spinner will not touch on Red?

☐ $\frac{1}{4}$ ☐ $\frac{3}{8}$ ☐ $\frac{3}{4}$ ☐ $\frac{5}{8}$

13. Which two colours have the same probability?

☐ and ☐

14. Kayla has 50 books on her bookshelf.
Twenty of these are fiction, twenty five are non-fiction and the rest are poetry.
Kayla picks a book at random from the shelf.
What is the probability that it is a poetry book?

$\frac{\square}{\square}$

15. Roger has 30 coins in his pocket.
There are six $2 coins, three $1 coins, eight 50¢ coins and the rest are 20¢ coins.
One coin falls from his pocket at random.
What is the probability that it was a 20¢ coin?

$\frac{\square}{\square}$

High School Mathematics Test 2013

Year 7

Sample Space and Probability

Calculator Allowed Short Answer Section

Name_____

Answer all questions in the spaces provided on this test paper by:
Writing the answer in the box provided.
or
Shading in the bubble for the correct answer from the four choices provided.
Show any working out on the test paper. Calculators are allowed.

Questions 1 – 4 refer to an experiment where Brenda rolls a normal six sided die and records the result.

1. List the sample space for the experiment.

2. What is the probability that the die will show an odd number on the upper face?

$$\frac{\square}{\square}$$

3. The probability that it will show a number more than 4 on the upper face is:

☐ $\frac{1}{6}$ ☐ $\frac{1}{3}$ ☐ $\frac{1}{2}$ ☐ $\frac{2}{3}$

4. The probability that it will show a factor of 6 on the upper face is:

☐ $\frac{1}{6}$ ☐ $\frac{1}{3}$ ☐ $\frac{1}{2}$ ☐ $\frac{2}{3}$

5. A newspaper article says:

"It is almost certain that a robbery will occur on any given day in Sydney."

Which decimal might represent this probability?

☐ 0.1 ☐ 0.5 ☐ 0.8 ☐ 0.99

6. Which words below would best describe the likelihood of **not** winning first prize in Oz Lotto.

☐ Almost Certain ☐ Almost Impossible ☐ Very likely ☐ Very unlikely

7. The weather bureau gives a prediction that there is a 25% chance of rain in the next 4 days.
Which statement accurately describes what will definitely happen in the next 4 days?

Statement 1 : It will rain on one day in the next 4 days.
Statement 2 : It will rain for 6 hours on each day in the next 4 days.

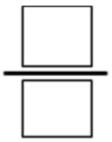
☐ Only Statement 1 is accurate.

☐ Only Statement 2 is accurate.

☐ Both Statements are accurate.

☐ Neither Statement is accurate.

8. At a dog breeding kennel there are 6 dashunds, 4 poodles and 10 spaniels.
One dog is chosen at random to be photographed for an advertisement.
What is the probability that it is a poodle?



9. Which probability indicates that an event is very unlikely to occur?

☐ 0.1 ☐ 0.4 ☐ 0.5 ☐ 0.8

10. Kelly makes 200 calls to customers as part of her job.
She says it is very likely that a customer will answer their phone.
If she is correct, how many customers would you expect to answer their phone?

☐ 10 ☐ 80 ☐ 100 ☐ 180

Questions 11 – 15 refer to the following:
Kellie asks a group of 30 people, their favourite musical style. The responses are shown on the table in Question 11.

11. Complete the missing frequency in the table.

Musical Style	*Frequency* (f)
Heavy Metal	8
Rock	6
Alternate	7
Hip Hop	
Country	3

12. What is the probability that a person chosen at random will say their favourite music is Alternate?

☐ $\frac{1}{15}$ ☐ $\frac{1}{10}$ ☐ $\frac{7}{30}$ ☐ $\frac{4}{15}$

13. What is the probability that a person chosen at random will say their favourite music is Heavy Metal?

☐ $\frac{1}{15}$ ☐ $\frac{1}{10}$ ☐ $\frac{7}{30}$ ☐ $\frac{4}{15}$

14. Which two styles have the same probability of being mentioned?

☐ and ☐

15. What is the probability that a person chosen at random will say their favourite style was something other than Country?

$\frac{\square}{\square}$

High School
Mathematics Test 2013

Year 7

Sample Space and Probability

ANSWERS

Non Calculator Section

1.	White T Shirt Blue T Shirt Green T Shirt Purple T Shirt
2.	Yes they are
3.	1 Sibling 2 Siblings 3 Siblings 4 Siblings 5 Siblings
4.	No they aren't
5.	Male relatives and female relatives were equally likely to win.
6.	Both Statements are true.
7.	$\frac{2}{7}$
8.	0.99
9.	A child chosen at random is a boy.

10.	

Colour	No of Sectors
Blue	2
Red	2
White	4

11.	$\frac{1}{4}$
12.	$\frac{3}{4}$
13.	Red and Blue
14.	$\frac{1}{10}$
15.	$\frac{13}{30}$

Calculator Allowed Section

1.	1, 2, 3, 4, 5, 6
2.	$\frac{1}{2}$
3.	$\frac{1}{3}$
4.	$\frac{2}{3}$
5.	0.99
6.	Almost Certain
7.	Neither Statement is accurate.
8.	$\frac{1}{5}$
9.	0.1

10.	180
11.	6
12.	$\frac{7}{30}$
13.	$\frac{4}{15}$
14.	Rock and Hip Hop
15.	$\frac{9}{10}$