

High School

Year 7 Mathematics Test – Probability,
Sample Space and Relative
Frequency

Calculator Test

Name

Questions 1 – 5 refer to the **experiment** in question 1.

1. Complete the **sample space** in the spaces below, for the question:
What is the probability that a person chosen at random is born on a certain day of the week?

Monday	Tuesday	Wednesday	Thursday
	Friday	Saturday	Sunday

2. What is the probability that a person chosen at random is born on a Monday?

$\frac{1}{2}$
☐

$\frac{1}{5}$
☐

$\frac{1}{6}$
☐

$\frac{1}{7}$
☒

3. What is the probability that a person chosen at random is born on a day that starts with the letter T?

$\frac{1}{7}$
☐

$\frac{2}{7}$
☒

$\frac{3}{7}$
☐

$\frac{5}{7}$
☐

4. What is the probability that a person chosen at random is born on a weekend?

$\frac{2}{7}$

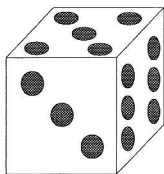
5. What is the probability that a person chosen at random is born after Monday but before Friday?

$\frac{3}{7}$

Questions 6 – 11 refer to the **experiment** in question 6.

6. Complete the **sample space** in the spaces below, for the question:
When a normal die is thrown, what is the probability that a certain number will show on the upper face?

This is an
example of
the die.



1	2	3
4	5	6

7. What is the probability that the die will show 5 on the upper face?

$$\frac{1}{2}$$

$$\frac{1}{5}$$

$$\frac{1}{6}$$

$$\frac{5}{6}$$

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

$$\frac{1}{2}$$

$$\frac{1}{3}$$

$$\frac{1}{4}$$

$$\frac{1}{6}$$

9. What is the probability that the die will not show 5 on the upper face?

$$\frac{5}{6}$$

10. What is the probability that the die will show more than one, but less than six spots on the upper face?

$$\frac{2}{3}$$

11. What is the probability that the number of spots on the upper face of the die will not be a prime number?

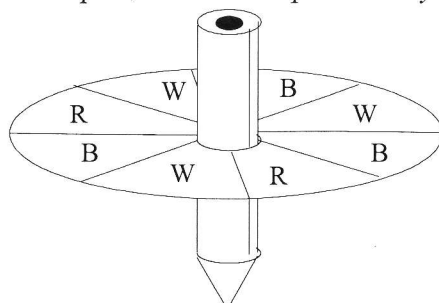
$$\frac{1}{2}$$

Questions 12 – 16 refer to the **experiment** in question 12.

12. 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 **sample space** in the spaces below, for the question:

When the spinner is spun, what is the probability that a certain colour is touching the table?



Blue	Blue
Blue	Red
White	Red
White	White

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

☐

$\frac{1}{4}$



$\frac{3}{8}$

☐

$\frac{3}{5}$

☐

$\frac{5}{8}$

14. What is the probability that the spinner will touch on Red?



$\frac{1}{4}$

☐

$\frac{3}{8}$

☐

$\frac{3}{5}$

☐

$\frac{5}{8}$

15. Which two colours have the same probability?

White

and

Blue

16. What is the probability that the spinner will touch on a colour other than White?

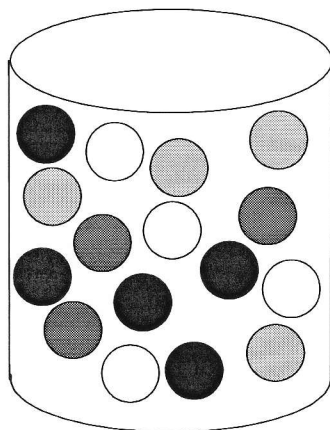
$$\frac{5}{8}$$

Questions 17 – 21 refer to the **experiment** in question 17.

17. A barrel in a game has 16 marbles which are coloured Black, Dark Grey, Light Grey or White as shown in the diagram below.

Complete the **table** below, showing the number of marbles of each colour. The table could be used to help answer the question:

When a marble is drawn at random from the barrel, what is the probability that it is a certain colour?



Colour	Number
Black	5
Dark Grey	3
Light Grey	4
White	4

18. What is the probability that a single marble drawn at random will be black?

☐

$\frac{5}{13}$

☐

$\frac{3}{16}$

☒

$\frac{5}{16}$

☐

$\frac{1}{4}$

19. What is the probability that a single marble drawn at random will be light grey?

☐

$\frac{1}{3}$

☐

$\frac{2}{3}$

☐

$\frac{3}{4}$

☒

$\frac{1}{4}$

20. Which two coloured marbles have the same probability of being drawn?

Light Grey

and

White

21. What is the probability that the marble drawn will be a colour other than Black?

11

16

Questions 22 – 26 refer to the following:

Kellie asks a group of 25 people, their favourite colour. The responses are shown on the table in Question 22.

22. Complete the relative frequency column of the table.

Colour	Frequency (<i>f</i>)	Relative Frequency
Pink	5	$\frac{1}{5} = 0.2$
Black	10	$\frac{2}{5} = 0.4$
White	4	$\frac{4}{25} = 0.16$
Blue	2	$\frac{2}{25} = 0.08$
Green	4	$\frac{4}{25} = 0.16$

Σf

23. What is the probability that a person chosen at random will say their favourite colour is Blue?

☐

$\frac{1}{5}$

☐

$\frac{2}{25}$

☒

$\frac{2}{23}$

☐

$\frac{4}{25}$

24. What is the probability that a person chosen at random will say their favourite colour is Black?

☐

$\frac{1}{5}$

☒

$\frac{2}{5}$

☐

$\frac{2}{3}$

☐

$\frac{3}{5}$

25. Which two colours have the same probability of being mentioned?

White

and

Green

26. What is the probability that a person chosen at random will say their favourite colour something other than Black?

$$\frac{3}{5}$$

Questions 27 – 30 refer to the following:

Kevin surveys a group of 80 people on the state where they were born. The responses are shown on the table in Question 27.

27. Complete the relative frequency column of the table.

Place of Birth	Frequency (f)	Relative Frequency
NSW	5	$\frac{1}{16} = 0.0625$
Vic	10	$\frac{1}{8} = 0.125$
Qld	16	$\frac{1}{5} = 0.2$
SA	10	$\frac{1}{8} = 0.125$
WA	13	$\frac{13}{50} = 0.26$
Tas	11	$\frac{11}{50} = 0.22$
NT	8	$\frac{1}{10} = 0.10$
ACT	7	$\frac{7}{80} = 0.0875$

$$\Sigma f = 80$$

28. What is the probability that a person chosen at random was born in WA?

☐

$\frac{13}{16}$

☐

$\frac{13}{67}$

☒

$\frac{13}{80}$

☐

$\frac{16}{80}$

29. What is the probability that a person chosen at random was born in Qld?

☐

$\frac{1}{16}$

☒

$\frac{1}{5}$

☐

$\frac{1}{10}$

☐

$\frac{1}{4}$

30. What is the probability that a person chosen at random was born in WA or SA?

$$\frac{23}{80}$$

$$80$$

High School

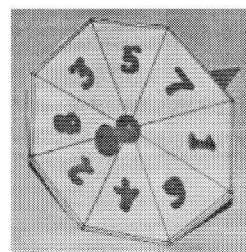
Year
8

Mathematics Test –
Further Probability

Non Calculator Test

Name

Question 1 to 5 refer to a spinner used in a board game which has 8 equal divisions, numbered from 1 to 8.



1. Complete the sample space for the spinner, which has been started below.

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

2. What is the probability (as a fraction) of the spinner stopping on the number 6?

$$P(6) = \frac{1}{8}$$

3. What is the probability of the spinner stopping on a number larger than 6?

$$P(\text{number} > 6) = \frac{1}{4}$$

4. What is the probability of the spinner stopping on a number other than 6?

$$P(\text{not } 6) = \frac{7}{8}$$

5. What is the probability of the spinner stopping on a number which is even and smaller than 7?

$$P(\text{even and } < 7) = \frac{\boxed{3}}{\boxed{8}}$$

Questions 6 to 9 refer to the ten letter tiles from a word game which have been used to make the word below. One tile is chosen at random from those shown.

E	X	C	E	L	L	E	N	C	E
---	---	---	---	---	---	---	---	---	---

6. List the sample space in alphabetical order.

C	C	E	E	E	E	L	L	N	X
---	---	---	---	---	---	---	---	---	---

7. What is the probability that the tile chosen is the letter N?

$$P(N) = \frac{\boxed{1}}{\boxed{10}}$$

8. What is the probability that the tile chosen is not the letter E?

$$P(\text{not E}) = \frac{\boxed{3}}{\boxed{5}}$$

9. What is the probability that the tile chosen is the letter X or the letter C?

$$P(X \text{ or } C) = \frac{\boxed{3}}{\boxed{10}}$$

10. The chance of a meteorite hitting the earth near you on the way home today could be described as :

☐ Very likely.
 ☐ Impossible.
 ☐ Certain
 ☒ Very Unlikely

11. What is the probability of a coin showing Heads when it is tossed?

☐ 0.2

☐ 0.4

☒ 0.5

☐ 0.6

12. Five hundred tickets are sold in a raffle. If you purchase 5 tickets, what are your chances of **not** winning the raffle?

☐ $\frac{249}{250}$
☒ $\frac{99}{100}$
☐ $\frac{49}{50}$
☐ $\frac{19}{20}$

13. A letter is chosen from the word OUTCOME. What is the probability that it is a not a vowel?

$$P(\text{not a vowel}) = \frac{\boxed{3}}{\boxed{7}}$$

Questions 14 to 17 refer to the table below, which shows the results of a survey of eye colours of a random sample of 40 people.

14. Complete the relative frequency column for Hazel and Black.

Eye Colour	Frequency	Relative Frequency
Blue	10	0.25
Brown	15	0.375
Green	8	0.2
Hazel	5	0.125
Black	2	0.05

15. What is the probability, if one person from the sample were chosen at random, that their eye colour would be Green or Blue?

$$P(\text{Green or Blue}) = \boxed{0.45}$$

16. One eye colour was twice as likely to occur as another colour in the sample. Which two colours were they?

☐ Blue and Black

☒ Blue and Hazel

☐ Green and Black

☐ Hazel and Black

17. What is the probability, if one person from the sample were chosen at random, that their eye colour would not be Blue?

$$P(\text{not Blue}) = \boxed{0.75}$$

Questions 18 to 20 refer to the table below showing the sport choices of a class of 20 students.

Sport	Frequency
Hockey	5
Football	8
Basketball	3
Tennis	4

One student from the class is chosen at random.

18. What is the probability that the student plays Hockey?

$$P(\text{Hockey}) = \frac{\boxed{5}}{\boxed{20}}$$

19. What is the probability that the student plays Hockey or Basketball?

$$P(\text{Hockey or Basketball}) = \frac{\boxed{8}}{\boxed{20}}$$

20. What is the probability that the student does **not** play Basketball?

$$P(\text{not Basketball}) = \frac{\boxed{17}}{\boxed{20}}$$

21. A letter is chosen at random from the word REFERENCES. What is the probability it is the letter E?

☐ $\frac{1}{10}$

☐ $\frac{1}{5}$

☐ $\frac{3}{10}$

☒ $\frac{2}{5}$

22. A special 6 sided die has its faces painted red and black. It is twice as likely to land on red as on black. How many of its faces are red?

☐ 2☐ 3☒ 4☐ 6

23. In Jonesville, garbage is collected on 5 days, from Monday to Friday. What is the probability that the garbage is collected at a random address on a Monday or a Tuesday?

☐ 0.2☒ 0.4☐ 0.5☐ 0.8

24. The probability that Aaron wins a game is $\frac{1}{3}$. What is the probability Aaron doesn't win the game?

2

3

25. A bag contains 3 blue, 4 red and 5 yellow marbles. What is the probability of selecting a marble which is not red or blue?

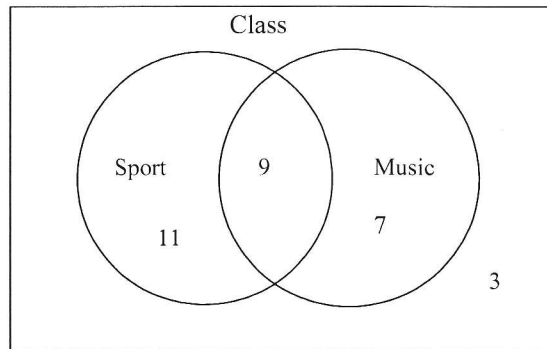
$$P(\text{not Red or Blue}) = \frac{\boxed{5}}{\boxed{12}}$$

26. One card is selected from a normal pack of 52 playing cards. What is the probability of it not being a 7?

☐ $\frac{1}{52}$ ☐ $\frac{1}{13}$ ☐ $\frac{51}{52}$ ☒ $\frac{12}{13}$

Questions 27 to 31 refer to the Venn diagram below.

In a class of 30 students, some play music and some play sport, the Venn diagram shows the numbers who do each.



A student is chosen at random from the class.

27. What is the probability that the student plays sport?

☐ $\frac{3}{10}$

☐ $\frac{11}{30}$

☒ $\frac{2}{3}$

☐ $\frac{9}{11}$

28. What is the probability that the student plays both sport and music?

☒ $\frac{3}{10}$

☐ $\frac{7}{30}$

☐ $\frac{9}{10}$

☐ $\frac{1}{3}$

29. What is the probability that the student plays either sport or music or both?

☐ $\frac{3}{10}$

☐ $\frac{7}{30}$

☒ $\frac{9}{10}$

☐ $\frac{1}{3}$

30. If we know that the student plays sport, what is the probability that they also play music?

☒ $\frac{9}{20}$

☐ $\frac{7}{30}$

☐ $\frac{9}{10}$

☐ $\frac{9}{11}$

31. What is the probability that the student doesn't play music?

☐ $\frac{8}{15}$

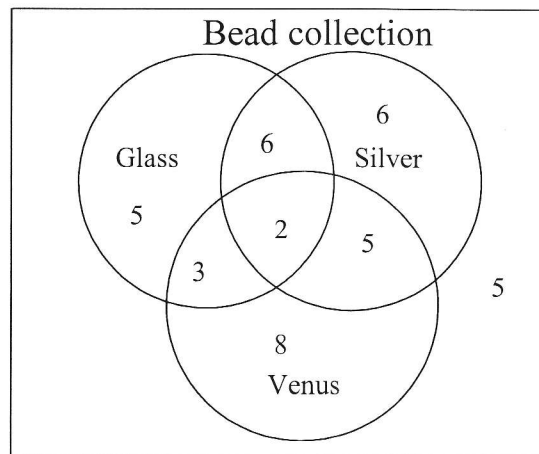
☒ $\frac{7}{15}$

☐ $\frac{23}{30}$

☐ $\frac{1}{10}$

Questions 32 to 36 refer to the Venn diagram below.

Kayla has a collection of 40 jewellery beads. Some have glass sections, some are silver and some are made by the Venus company.



A bead is chosen at random from the collection.

32. What is the probability that the bead is silver?

☒ $\frac{19}{40}$

☐ $\frac{3}{10}$

☐ $\frac{19}{35}$

☐ $\frac{3}{20}$

33. What is the probability that the bead is silver and made by Venus?

☐ $\frac{1}{20}$

☒ $\frac{7}{40}$

☐ $\frac{7}{35}$

☐ $\frac{1}{8}$

34. What is the probability that the bead is either silver or has a glass section or both?

☐ $\frac{1}{5}$

☐ $\frac{11}{40}$

☐ $\frac{5}{8}$

☒ $\frac{27}{40}$

35. If we know that the bead is made by Venus, what is the probability it is silver?

☐ $\frac{5}{8}$

☒ $\frac{7}{18}$

☐ $\frac{7}{8}$

☐ $\frac{5}{18}$

36. What is the probability that the bead isn't made by Venus?

☒ $\frac{11}{20}$

☐ $\frac{1}{5}$

☐ $\frac{4}{5}$

☐ $\frac{17}{35}$

Questions 37 to 40 refer to the two way table below, which shows the makeup of a soccer club's membership.

Gender	Male	Female	Totals
Seniors	14	16	30
Juniors	35	25	60
Totals	49	41	90

One person is chosen at random from the club membership.

37. What is the probability that the person is a male?

☐ $\frac{7}{18}$

☐ $\frac{5}{7}$

☒ $\frac{49}{90}$

☐ $\frac{2}{3}$

38. What is the probability that the person is a junior male?

☒ $\frac{7}{18}$

☐ $\frac{5}{7}$

☐ $\frac{49}{90}$

☐ $\frac{2}{3}$

39. What is the probability that the person is either a senior or a female (or both)?

☐ $\frac{71}{90}$

☒ $\frac{11}{18}$

☐ $\frac{2}{3}$

☐ $\frac{8}{45}$

40. If it known that the person is male, what is the probability that he is a junior?

☐ $\frac{7}{18}$

☒ $\frac{5}{7}$

☐ $\frac{49}{90}$

☐ $\frac{2}{3}$