

Topic test 10

Probability

- Time allowed: 45 minutes
- Part A: 20 multiple-choice questions (40 marks)
- Part B: 8 free-response questions (60 marks)

Name: _____

Part A

20 multiple-choice questions

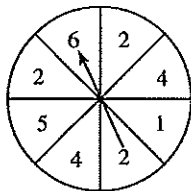
2 marks each: 40 marks

Circle the correct answer.

- 1 Which term best describes the chance of rolling an even number on a die?
 - A likely
 - B impossible
 - C unlikely
 - D even chance
- 2 How many different outcomes are there when tossing a coin?
 - A 1
 - B 4
 - C 2
 - D 6
- 3 If the probability that it will snow tomorrow is 15%, what is the probability that it will not snow?
 - A 0%
 - B 85%
 - C 30%
 - D 45%

- 4 On this spinner, what is the probability of spinning a 2?

- A $33\frac{1}{3}\%$
- B 25%
- C $37\frac{1}{2}\%$
- D $66\frac{2}{3}\%$



- 5 On the above spinner, what is the probability of spinning a number less than 5?

- A $\frac{3}{4}$
- B $\frac{3}{8}$
- C $\frac{7}{8}$
- D $\frac{2}{3}$

- 6 A term that can be used to describe an event with a probability of 0.75 is:

- A impossible
- B likely
- C certain
- D unlikely

- 7 What is the probability that a person chosen at random has a birthday in a month beginning with M?

- A $\frac{1}{12}$
- B $\frac{1}{2}$
- C $\frac{1}{6}$
- D $\frac{1}{4}$

- 8 A meeting room contains 1 man, 5 women, 4 boys and 3 girls. What is the probability that a person chosen at random is a child?

- A $\frac{6}{7}$
- B $\frac{7}{13}$
- C $\frac{6}{13}$
- D $\frac{1}{7}$

- 9 If two coins are tossed, what is the probability that both show heads?

- A $\frac{1}{2}$
- B $\frac{1}{4}$
- C $\frac{1}{3}$
- D $\frac{1}{6}$

- 10 What is the probability of rolling 4 on a die?

- A 0.4
- B 0.6
- C 0.25
- D 0.16

- 11 Which one of the following could *not* be the probability of an event?

- A 1
- B -1
- C 0
- D 0.001

- 12 The set of all possible outcomes of a situation is called the:

- A experiment
- B likelihood
- C sample space
- D complementary event

- 13 A whole number is chosen at random from 1 to 9. What is the probability that it is an odd number?

- A $\frac{1}{9}$
- B $\frac{4}{9}$
- C $\frac{1}{2}$
- D $\frac{5}{9}$

Topic test 10: Probability *continued*

14 What is the probability that the number chosen in Question 13 above is a multiple of 3?

- A $\frac{4}{9}$ B $\frac{2}{9}$
C $\frac{1}{3}$ D $\frac{2}{3}$

Questions 15 to 17 refer to the following frequency table that shows the number of heads and tails that came up when a coin was tossed repeatedly.

Outcome	Frequency
Heads	72
Tails	28

15 How many times was the coin tossed?

- A 100 B 2
C 50 D 72

16 What was the relative frequency of tails?

- A 0.5 B 0.28
C 0.1 D 0.38

17 If the coin was tossed 300 times, how many tails would you expect?

- A 28 B 150
C 50 D 84

Questions 18 to 20 refer to choosing a lolly at random from a jar containing 60 coloured lollies: red, blue, yellow, green. The chance of choosing a red lolly is $\frac{1}{4}$. The chance of choosing a yellow lolly is $\frac{1}{3}$.

18 What is the probability of drawing out a red or yellow lolly?

- A $\frac{1}{2}$ B $\frac{1}{12}$
C $\frac{7}{12}$ D $\frac{5}{12}$

19 What is the probability of drawing out a lolly that is neither red nor yellow?

- A $\frac{3}{4}$ B $\frac{5}{12}$
C $\frac{7}{12}$ D $\frac{1}{2}$

20 Lara writes down the probability of choosing a green lolly. Which one of these is a possible answer?

- A $\frac{5}{12}$ B $\frac{7}{12}$
C $\frac{1}{2}$ D $\frac{11}{60}$

Part B

8 free-response questions

60 marks

Show working where appropriate.

21 (8 marks) List the sample space of possible outcomes for each situation:

- a the colour of a traffic light
b the number of girls in a 3-child family
c the answer to a multiple-choice question in Part A of this test
d the result of a driving test

22 (6 marks) Use one of the following words to describe the probability of each event:

certain, even chance, impossible, likely, unlikely.

- a You will send an e-mail today
b You will have a Science test this month
c You will play a ball sport tomorrow

23 (8 marks) A box contains raffle tickets: 9 red, 5 green, 8 yellow and 6 white tickets. Find as a simple fraction the probability that the ticket drawn for first prize is:

- a green
b yellow or white
c blue
d not red

Topic test 10: Probability *continued*

24 (10 marks) A die has these numbers on its faces: 0, 1, 3, 4, 4, 6.

a Is each number equally likely? Explain your answer.

b Find the probability of rolling:

i a 3

ii an odd number

iii a number greater than 1

iv a number that is not prime

25 (6 marks) Write an example of an event that might have a probability of:

a 100%

b 12%

c 80%

26 (4 marks) From the letters of the word PARRAMATTA, one letter is chosen at random.

a What is the most likely letter?

b What is the probability that the chosen letter is an R?

27 (6 marks) The chance of it raining on any November day is $\frac{7}{20}$

a What is the chance of it not raining on a November day?

b How many days are there in November?

c On how many whole days in November would you expect it to be not raining?

28 (12 marks) This table shows the results of a survey on how students travel to school.

Transport	Frequency
Walk	8
Bus	21
Car	16
Bike	5

a How many students were surveyed?

b What percentage of students travel by bus?

c What is the probability that a student chosen at random from this survey travels by bike?

d What is the probability that a student chosen at random travels by car or bus?

e What is the complementary event to choosing a student who walks to school?

f If the school has 800 students, how many would you expect to travel by car?

END OF TEST.

**Use the back of this page
for extra working space.**

Topic test 10

Probability

Name: ANSWERS

- Time allowed: 45 minutes
- Part A: 20 multiple-choice questions (40 marks)
- Part B: 8 free-response questions (60 marks)

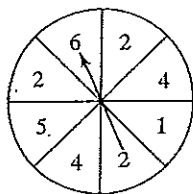
Part A

20 multiple-choice questions

2 marks each: 40 marks

Circle the correct answer.

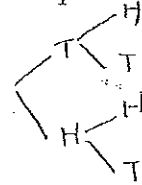
- 1 Which term best describes the chance of rolling an even number on a die?
 - A likely
 - B impossible
 - C unlikely
 - D even chance
- 2 How many different outcomes are there when tossing a coin?
 - A 1
 - B 4
 - C 2
 - D 6
- 3 If the probability that it will snow tomorrow is 15%, what is the probability that it will not snow?
 - A 0%
 - B 85%
 - C 30%
 - D 45%
- 4 On this spinner, what is the probability of spinning a 2?
 - A $33\frac{1}{3}\%$
 - B 25%
 - C $37\frac{1}{2}\%$
 - D $66\frac{2}{3}\%$
- 5 On the above spinner, what is the probability of spinning a number less than 5?
 - A $\frac{3}{4}$
 - B $\frac{3}{8}$
 - C $\frac{7}{8}$
 - D $\frac{2}{3}$
- 6 A term that can be used to describe an event with a probability of 0.75 is:
 - A impossible
 - B likely
 - C certain
 - D unlikely



- 7 What is the probability that a person chosen at random has a birthday in a month beginning with M?
 - A $\frac{1}{12}$
 - B $\frac{1}{2}$
 - C $\frac{1}{6}$
 - D $\frac{1}{4}$

- 8 A meeting room contains 1 man, 5 women, 4 boys and 3 girls. What is the probability that a person chosen at random is a child?
 - A $\frac{6}{7}$
 - B $\frac{7}{13}$
 - C $\frac{6}{13}$
 - D $\frac{1}{7}$

- 9 If two coins are tossed, what is the probability that both show heads?
 - A $\frac{1}{2}$
 - B $\frac{1}{4}$
 - C $\frac{1}{3}$
 - D $\frac{1}{6}$



- 10 What is the probability of rolling 4 on a die?
 - A 0.4
 - B 0.6
 - C 0.25
 - D 0.16

- 11 Which one of the following could *not* be the probability of an event?
 - A 1
 - B -1
 - C 0
 - D 0.001

- 12 The set of all possible outcomes of a situation is called the:
 - A experiment
 - B likelihood
 - C sample space
 - D complementary event

- 13 A whole number is chosen at random from 1 to 9. What is the probability that it is an odd number?
 - A $\frac{1}{9}$
 - B $\frac{4}{9}$
 - C $\frac{1}{2}$
 - D $\frac{5}{9}$

1, 3, 5, 7, 9

Topic test 10: Probability *continued*

14 What is the probability that the number chosen in Question 13 above is a multiple of 3?

- A $\frac{4}{9}$ B $\frac{2}{9}$ 3, 6, 9
 ✓ C $\frac{1}{3}$ D $\frac{2}{3}$

20 Lara writes down the probability of choosing a green lolly. Which one of these is a possible answer?

- A $\frac{5}{12}$ B $\frac{7}{12}$
 C $\frac{1}{2}$ D ✓ $\frac{11}{60}$

Questions 15 to 17 refer to the following frequency table that shows the number of heads and tails that came up when a coin was tossed repeatedly.

Outcome	Frequency
Heads	72
Tails	28

15 How many times was the coin tossed?

- ✓ A 100 B 2
 C 50 D 72

16 What was the relative frequency of tails?

- A 0.5 ✓ B 0.28
 C 0.1 D 0.38

17 If the coin was tossed 300 times, how many tails would you expect?

- A 28 B 150
 C 50 ✓ D 84

Questions 18 to 20 refer to choosing a lolly at random from a jar containing 60 coloured lollies: red, blue, yellow, green. The chance of choosing a red lolly is $\frac{1}{4}$. The chance of choosing a yellow lolly is $\frac{1}{3}$.

18 What is the probability of drawing out a red or yellow lolly?

- A $\frac{1}{2}$ B $\frac{1}{12}$ $\frac{1}{4}$ Red
 ✓ C $\frac{7}{12}$ D $\frac{5}{12}$ $\frac{1}{3}$ yellow

19 What is the probability of drawing out a lolly that is neither red nor yellow?

- A $\frac{3}{4}$ ✓ B $\frac{5}{12}$
 C $\frac{7}{12}$ D $\frac{1}{2}$

Part B

8 free-response questions

60 marks

Show working where appropriate.

21 (8 marks) List the sample space of possible outcomes for each situation:

- a the colour of a traffic light
 red, ~~orange~~ yellow, green ✓
 b the number of girls in a 3-child family
 one girl, 2 girls, all girls ✓
 c the answer to a multiple-choice question in Part A of this test
 a, b, c, d ✓
 d the result of a driving test
 fail, pass ✓

22 (6 marks) Use one of the following words to describe the probability of each event:

certain, even chance, impossible, likely, unlikely.

- a You will send an e-mail today
 likely even chance ✓
 b You will have a Science test this month
 unlikely ✓
 c You will play a ball sport tomorrow
 unlikely ✓

23 (8 marks) A box contains raffle tickets: 9 red, 5 green, 8 yellow and 6 white tickets. Find as a simple fraction the probability that the ticket drawn for first prize is:

- a green $\frac{5}{28}$ ✓
 b yellow or white $\frac{14}{28} = \frac{1}{2}$ ✓
 c blue ○ ✓
 d not red $\frac{19}{28}$ ✓

Topic test 10: Probability continued

24 (10 marks) A die has these numbers on its faces: 0, 1, 3, 4, 4, 6.

a Is each number equally likely? Explain your answer. *no, there are two faces that contain the number 4 while only one face contains the other numbers.*

b Find the probability of rolling:
i a 3 $\frac{1}{6}$ ✓

ii an odd number $\frac{2}{6} = \frac{1}{3}$ ✓

iii a number greater than 1 $\frac{4}{6} = \frac{2}{3}$ ✓

iv a number that is not prime $\frac{3}{6} = \frac{1}{2}$ ✓

25 (6 marks) Write an example of an event that might have a probability of:

a 100% *The sun will come out tomorrow.* ✓

b 12% *Someone will give me a surprise present.* ✓

c 80% *It will be sunny tomorrow.* ✓

26 (4 marks) From the letters of the word PARRAMATTA, one letter is chosen at random.

a What is the most likely letter?
A ✓

b What is the probability that the chosen letter is an R?
 $\frac{2}{10} = \frac{1}{5}$ ✓

27 (6 marks) The chance of it raining on any November day is $\frac{7}{20}$

a What is the chance of it not raining on a November day?
 $\frac{13}{20}$ ✓

b How many days are there in November?
30 ✓

c On how many whole days in November would you expect it to be not raining?
19.5
19 days not raining. ✓

28 (12 marks) This table shows the results of a survey on how students travel to school.

Transport	Frequency
Walk	8
Bus	21
Car	16
Bike	5

a How many students were surveyed?
~~60~~ *50*

b. What percentage of students travel by bus?
 $\frac{21}{50} = 42\%$

c What is the probability that a student chosen at random from this survey travels by bike?
 $\frac{5}{50} = \frac{1}{10}$

d What is the probability that a student chosen at random travels by car or bus?
 $\frac{37}{50}$

e What is the complementary event to choosing a student who walks to school?
Choosing a student who does not walk to school i.e. bus, car, bike. ✓

f If the school has 800 students, how many would you expect to travel by car?
 $\frac{16}{50} \times 800 = 256$

END OF TEST.

Use the back of this page for extra working space.