

Topic test 5

Probability

- Time allowed: 45 minutes.
- Part A: 20 multiple-choice questions (40 marks)
- Part B: 10 free-response questions (60 marks)

Name: _____

Part A

20 multiple-choice questions

2 marks each: 40 marks

Circle the correct answer.

- 1 How many different outcomes are possible when a coin is tossed?

| | |
|-----|-----|
| A 6 | B 4 |
| C 1 | D 2 |
- 2 How many hearts cards are there in a normal deck of cards?

| | |
|------|------|
| A 12 | B 13 |
| C 10 | D 52 |
- 3 What is the probability of a baby being born on a weekday rather than on a weekend?

| | |
|-----------------|-----------------|
| A $\frac{2}{3}$ | B $\frac{2}{7}$ |
| C $\frac{3}{5}$ | D $\frac{5}{7}$ |
- 4 Which term best describes the chance of rolling an odd number on a die?

| | |
|---------------|--------------|
| A impossible | B improbable |
| C even chance | D likely |
- 5 The probability that it will rain this weekend is 33%. What is the probability that it will not rain?

| | |
|-------|-------|
| A 66% | B 77% |
| C 33% | D 67% |
- 6 The probability of a 'certain' event is:

| | |
|-----|------|
| A 1 | B -1 |
| C 0 | D 10 |
- 7 On this spinner, what is the probability of spinning a 3 or 4?

| | |
|-------|-------|
| A 0.3 | B 0.7 |
| C 0.5 | D 0.6 |
- 8 On the above spinner, what is the probability of spinning a number greater than 6?

| | |
|-----------------|-----------------|
| A $\frac{1}{6}$ | B $\frac{2}{5}$ |
| C $\frac{1}{4}$ | D $\frac{1}{5}$ |
- 9 The set of all possible outcomes of a situation is called the:

| | |
|----------------|-----------------------|
| A experiment | B complementary event |
| C sample space | D likelihood |
- 10 What is the probability that a person chosen at random has a birthday in a month beginning with J?

| | |
|------------------|------------------|
| A $\frac{1}{12}$ | B $\frac{1}{31}$ |
| C $\frac{1}{6}$ | D $\frac{1}{4}$ |
- 11 What is the *complementary event* to drawing a red card from a deck of cards?

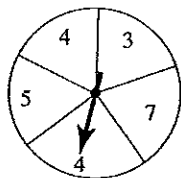
| | |
|------------------------------------|-------------------------------------|
| A drawing a hearts or spades card | B drawing a hearts or diamonds card |
| C drawing a clubs or diamonds card | D drawing a clubs or spades card |
- 12 The lowest possible value of a probability is:

| | |
|-------|-----|
| A -1 | B 0 |
| C 0.1 | D 1 |
- 13 Five students — Henry, Irene, Jack, Kathy and Lisa write their names on separate cards. One card is chosen at random. What is the probability that a boy's name is chosen?

| | |
|-----------------|-----------------|
| A $\frac{2}{5}$ | B $\frac{2}{3}$ |
| C $\frac{1}{3}$ | D $\frac{3}{5}$ |
- 14 One ticket is drawn out at random from a box of blue, orange, green, red and yellow raffle tickets. The chance of drawing a blue ticket is $\frac{16}{75}$. The chance of drawing an orange ticket is $\frac{28}{75}$. What is the probability of drawing out a blue or orange ticket?

| | |
|-------------------|-------------------|
| A $\frac{4}{25}$ | B $\frac{44}{75}$ |
| C $\frac{22}{75}$ | D $\frac{2}{25}$ |
- 15 What is the probability that the ticket drawn in Question 14 is not blue or orange?

| | |
|-------------------|-------------------|
| A $\frac{47}{75}$ | B $\frac{59}{75}$ |
| C $\frac{31}{75}$ | D $\frac{56}{75}$ |



Topic test 5: Probability *continued*

- 16 If the box in Question 14 actually contains 300 tickets, how many would you expect to be orange?
- A 11 B 37
C 84 D 112
- 17 Which term is different to the other three?
- A probable B almost certain
C unlikely D good chance
- 18 There are 400 raffle tickets in a competition. Jenny buys 8 tickets. What is the probability that she wins first prize?
- A 0.2 B 0.005
C 0.02 D 0.0025
- 19 What is the probability Jenny doesn't win first prize?
- A 0.9825 B 0.98
C 0.95 D 0.9975
- 20 The sum of the probability of an event occurring and the probability of the same event not occurring is equal to:
- A $\frac{1}{2}$ B 0
C 2 D 1
- 22 (8 marks) A jar contains 8 red lollies, 10 green lollies, 6 yellow lollies and 6 white lollies. One lolly is chosen at random from the jar. Calculate as a simple fraction the probability that the chosen lolly is:
- a green
b red or green
c blue
d not white
- 23 (10 marks)
- a List all possible outcomes when a die is rolled.
- b Find the probability of rolling:
- i a 3?
ii an event number?
iii a number greater than 1?
iv a composite number?
- 24 (8 marks) A card is selected at random from a normal deck of 52 cards. What is the probability of selecting:
- a a hearts card?
b a red 7?
c an Ace card?
d a black picture card (J, K, Q)?

Part B

10 free-response questions

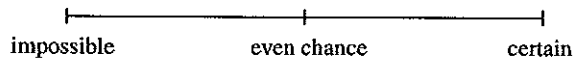
60 marks

Show working where appropriate.

- 21 (6 marks) Rate each of the following events as being: **unlikely, likely, certain, impossible** or **even chance**.
- a A double 6 comes up when you roll two dice.
- b You driving a car in 10 years time.
- c There were cars on the Sydney Harbour Bridge this morning.

Topic test 5: Probability *continued*

25 (5 marks) Use the given letters to mark the positions of the events below on the scale:



- E. There will be an e-mail for you today.
- V. You will eat vegetables today.
- A. There will be a car accident in Sydney today.
- T. You will be 180 cm tall tomorrow.
- C. You will catch a cold within 6 months

26 (2 marks) Give an example of an event that might have a probability close to 10%.

27 (6 marks)

- a For traffic lights, list all of the possible outcomes.
- b Explain why each outcome is not equally likely.
- c What is the complementary event to the traffic lights showing green?

28 (8 marks) A sock drawer contains 16 white socks, 8 grey socks, 6 brown socks and 6 green socks. One sock is chosen from the drawer without looking.

- a What is the most likely colour of this sock?
- b What event is *complementary* to choosing a grey sock?
- c What is the probability that the sock is brown?
- d What is the probability that the sock is not brown?

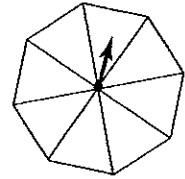
29 (3 marks) Place the letters D , K , N and T on the sections of this spinner if the following probabilities are true for one spin of it:

$$P(D) = 0.125$$

$$P(K) = 0.375$$

$$P(N) = 0.25$$

$$P(T) = 0.25$$



30 (4 marks) In my town, the chance of a day in April being sunny is 90%.

- a How many days are there in April?
- b On how many days would you expect it to be sunny in April?

END OF TEST.

Use the rest of this column and the back for extra working space.

Topic test 5**Probability****ANSWERS**

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- Part B: 10 free-response questions (60 marks)

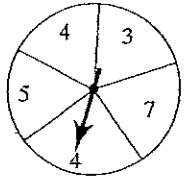
Name: _____

Part A

20 multiple-choice questions

2 marks each: 40 marks

Circle the correct answer.

- 1 How many different outcomes are possible when a coin is tossed?
 A 6 B 4
 C 1 **D 2**
- 2 How many hearts cards are there in a normal deck of cards?
 A 12 **B 13**
 C 10 D 52
- 3 What is the probability of a baby being born on a weekday rather than on a weekend?
 A $\frac{2}{3}$ B $\frac{2}{7}$
 C $\frac{3}{5}$ **D $\frac{5}{7}$**
- 4 Which term best describes the chance of rolling an odd number on a die?
 A impossible B improbable
C even chance D likely
- 5 The probability that it will rain this weekend is 33%. What is the probability that it will not rain?
 A 66% B 77%
 C 33% **D 67%**
- 6 The probability of a 'certain' event is:
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 C 0 D 10
- 7 On this spinner, what is the probability of spinning a 3 or 4?
 A 0.3 B 0.7
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- 8 On the above spinner, what is the probability of spinning a number greater than 6?
 A $\frac{1}{6}$ B $\frac{2}{5}$
 C $\frac{1}{4}$ **D $\frac{1}{5}$**
- 9 The set of all possible outcomes of a situation is called the:
 A experiment
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C sample space
 D likelihood
- 10 What is the probability that a person chosen at random has a birthday in a month beginning with J?
 A $\frac{1}{12}$ B $\frac{1}{31}$
 C $\frac{1}{6}$ **D $\frac{1}{4}$**
- 11 What is the *complementary event* to drawing a red card from a deck of cards?
 A drawing a hearts or spades card
 B drawing a hearts or diamonds card
 C drawing a clubs or diamonds card
D drawing a clubs or spades card
- 12 The lowest possible value of a probability is:
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 C 0.1 D 1
- 13 Five students — Henry, Irene, Jack, Kathy and Lisa write their names on separate cards. One card is chosen at random. What is the probability that a boy's name is chosen?
A $\frac{2}{5}$ B $\frac{2}{3}$
 C $\frac{1}{3}$ D $\frac{3}{5}$
- 14 One ticket is drawn out at random from a box of blue, orange, green, red and yellow raffle tickets. The chance of drawing a blue ticket is $\frac{16}{75}$. The chance of drawing an orange ticket is $\frac{28}{75}$. What is the probability of drawing out a blue or orange ticket?
 A $\frac{4}{25}$ **B $\frac{44}{75}$**
 C $\frac{22}{75}$ D $\frac{2}{25}$
- 15 What is the probability that the ticket drawn in Question 14 is not blue or orange?
 A $\frac{47}{75}$ B $\frac{59}{75}$
C $\frac{31}{75}$ D $\frac{56}{75}$

Topic test 5: Probability continued

16 If the box in Question 14 actually contains 300 tickets, how many would you expect to be orange?

- A 11 B 37
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17 Which term is different to the other three?

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- A $\frac{1}{2}$ B 0
C 2 **D 1**

Part B

10 free-response questions

60 marks

Show working where appropriate.

21 (6 marks) Rate each of the following events as being: **unlikely, likely, certain, impossible** or **even chance**.

a A double 6 comes up when you roll two dice.

unlikely ($\frac{1}{36}$)

b You driving a car in 10 years time.

likely ??

c There were cars on the Sydney Harbour Bridge this morning.

certain

22 (8 marks) A jar contains 8 red lollies, 10 green lollies, 6 yellow lollies and 6 white lollies. One lolly is chosen at random from the jar. Calculate as a simple fraction the probability that the chosen lolly is:

a green $\frac{10}{30} = \frac{1}{3}$

b red or green $\frac{18}{30} = \frac{3}{5}$

c blue 0

d not white $\frac{24}{30} = \frac{4}{5}$

23 (10 marks)

a List all possible outcomes when a die is rolled. 1, 2, 3, 4, 5, 6

b Find the probability of rolling:

i a 3? $\frac{1}{6}$

ii an even number? $\frac{1}{2}$

iii a number greater than 1? $\frac{5}{6}$

iv a composite number? $\frac{2}{6} = \frac{1}{3}$

24 (8 marks) A card is selected at random from a normal deck of 52 cards. What is the probability of selecting:

a a hearts card? $\frac{13}{52} = \frac{1}{4}$

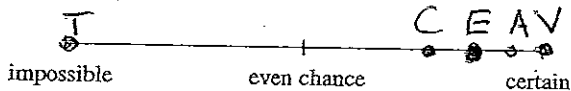
b a red 7? $\frac{2}{52} = \frac{1}{26}$

c an Ace card? $\frac{4}{52} = \frac{1}{13}$

d a black picture card (J, K, Q)? $\frac{6}{52} = \frac{3}{26}$

Topic test 5: Probability continued

25 (5 marks) Use the given letters to mark the positions of the events below on the scale:



- E. There will be an e-mail for you today.
- V. You will eat vegetables today.
- A. There will be a car accident in Sydney today.
- T. You will be 180 cm tall tomorrow.
- C. You will catch a cold within 6 months

26 (2 marks) Give an example of an event that might have a probability close to 10%.

Choose from nos 1-100 raffle tickets. Probability of getting no or less = 10%

27 (6 marks)

a For traffic lights, list all of the possible outcomes.

Green
Orange (Amber)
Red

b Explain why each outcome is not equally likely.

Green and red are showing longer than amber - not equally likely.

c What is the complementary event to the traffic lights showing green?

Traffic lights showing amber or red.

28 (8 marks) A sock drawer contains 16 white socks, 8 grey socks, 6 brown socks and 6 green socks. One sock is chosen from the drawer without looking.

a What is the most likely colour of this sock?

white

b What event is complementary to choosing a grey sock? Choosing a white, brown or green sock.

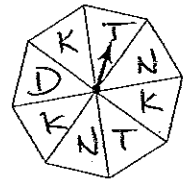
c What is the probability that the sock is brown?

$$P(\text{Brown}) = \frac{6}{36} = \frac{1}{6}$$

d What is the probability that the sock is not brown?

$$P(\text{not brown}) = 1 - P(\text{Brown}) = 1 - \frac{1}{6} = \frac{5}{6}$$

29 (3 marks) Place the letters D, K, N and T on the sections of this spinner if the following probabilities are true for one spin of it:



$$P(D) = 0.125$$

$$P(K) = 0.375$$

$$P(N) = 0.25$$

$$P(T) = 0.25$$

30 (4 marks) In my town, the chance of a day in April being sunny is 90%.

a How many days are there in April?

30

b On how many days would you expect it to be sunny in April?

$$90\% \text{ of } 30 = 27 \text{ days.}$$

END OF TEST.

Use the rest of this column and the back for extra working space.