Basic Probability Test Non Calculator

Year 9

Short Answer Section

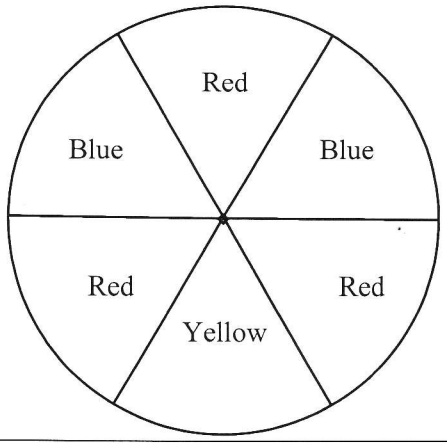
Name : _____

Write all working and answers in the spaces provided on this test paper.

1. What is the probability of drawing a card showing a diamond from a normal pack of cards?

$P(\text{Diamond}) = \frac{13}{52} = \frac{1}{4}$

2. A spinner in a game has six equal sectors coloured as shown. What is the probability of the spinner landing on a blue sector on a single spin?



$P(\text{Blue}) = \frac{2}{6} = \frac{1}{3}$

3. The probability that a swimmer wins a particular race is 80%. What is the probability that he will not win?

$P(\text{not win}) = 1 - P(\text{win}) = 1 - 0.8 = 0.2 = 20\%$

4. On a single roll of a fair die, what is the probability of rolling a number larger than 4?

$P(5 \text{ or } 6) = \frac{2}{6} = \frac{1}{3}$

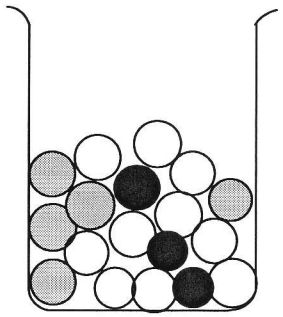
5. Give an estimate for the probability that it will rain at some stage in the next six months.

Would be very close to 1

6. A raffle has 200 tickets and Jessica buys 10 tickets. What is the probability that she will win the raffle?

$P(\text{win}) = \frac{10}{200} = \frac{1}{20}$

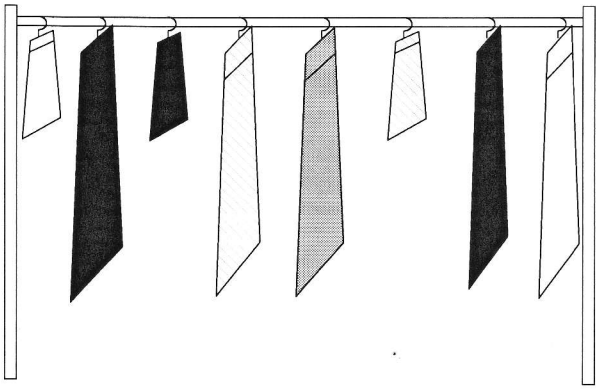
7. Find the probability of drawing a grey or black ball from the container shown.



$P(\text{Grey or Black}) = \frac{8}{18}$

$= \frac{4}{9}$

Questions 8 -10 refer to the drawing of the 8 skirts in Andreas wardrobe. Andrea selects a skirt at random.



8. What is the probability that she will select a long black skirt?

$P(\text{long black}) = \frac{2}{8} = \frac{1}{4}$

9. What is the probability that she will not select a short black skirt?

$P(\text{not short black}) = 1 - \frac{1}{8} = \frac{7}{8}$

10. What is the probability that she will select a skirt that is either long or white?

$P(\text{long or white}) = \frac{6}{8} = \frac{3}{4}$

Questions 11 -14 refer to the table below which records Andy's results in his last 50 tennis matches comparing how often his first serve was in.

	Serve ≥60%	Serve < 60%	Totals
Won the match	25	6	31
Lost the match	7	12	19
Totals	32	18	50

One of his matches is chosen at random.

11. What is the probability that he won the match?

$P(won) = \frac{31}{50}$

12. What is the probability that he served < 60% in the match?

$P(\text{serve} < 60\%) = \frac{18}{50} = \frac{9}{25}$

13. What is the probability that he won the match and served < 60%?

$P(\text{won and serve} < 60) = \frac{6}{50} = \frac{3}{25}$

14. If we know that he won the match, what is the probability that he served < 60% in the match?

$P(\text{serve} < 60 \text{ given won}) = \frac{6}{31}$

Basic Probability Test

Year 9

Calculator

Multiple Choice Section

Name : _____

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. In a single throw of a normal die, the probability of an even number showing is :

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

2. Joe said "There are fourteen students in a foot race. The probability that any one student will win the race is $\frac{1}{14}$"
   This statement is:
   A. always true, regardless of who the students are.
   B. always false, regardless of who the students are.
   C. true only if one student is far better than the others.
   D. true only if all of the students had equal ability.

3. The probability that the sun will rise tomorrow would be :

   A. Close to 1
   B. Close to 0.
   C. About 0.5
   D. Between 0.5 and 0.8

4. The letters of the word EXCELLENT are written on separate cards and placed in a hat. One card is drawn out at random. What is the probability that it shows the letter E?

   A. $\frac{1}{9}$ B. $\frac{1}{6}$ C. $\frac{1}{3}$ D. $\frac{2}{3}$

5. A raffle has 200 tickets, numbered 1 to 200. Mitchell buys all of the tickets which end in a 0. What is the probability that he will win?

   A. $\frac{1}{200}$ B. $\frac{1}{20}$ C. $\frac{1}{10}$ D. $\frac{1}{50}$

6. Which of the following percentages would best represent an event which was unlikely to occur?

   A 25% B 50% C 75% D 100%

7. A bag contains 8 cards labelled 1 to 8. What is the probability of selecting the 2 or 3?

   A $\frac{1}{8}$ **B** $\frac{1}{4}$ **C** $\frac{3}{4}$ **D** $\frac{7}{8}$

8. A bag contains white and red balls. If the probability of selecting a white ball is $\frac{7}{10}$, what is the probability of selecting a red ball?

A $\frac{1}{5}$ **B** $\frac{3}{10}$ **C** $\frac{2}{5}$ **D** $\frac{7}{10}$

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9. A card is selected from a normal pack of 52 cards. What is the probability that it is a black ace or a black king?

A. $\frac{1}{26}$ B. $\frac{2}{13}$ C. $\frac{4}{13}$ D. $\frac{1}{13}$

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10. What is the probability of not rolling a 2 or 3 on a single roll of a die?

A. $\frac{1}{3}$ B $\frac{1}{6}$ C. $\frac{2}{3}$ D. $\frac{5}{6}$

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11. A bag contains 40 marbles of different colours. We know that 16 are red, 12 are blue and the rest are yellow. One marble is drawn at random from the bag. Which statement is correct?

A. The probability of drawing a red marble equals the probability of drawing a blue marble.
B. The probability of drawing a blue marble equals the probability of drawing a yellow marble.
C. The probability of drawing a red marble equals the probability of drawing a yellow marble.
D. No two colours have the same probability.

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12. The letters of the word ASSESSMENT are written on separate cards and placed in a hat. One card is chosen at random. What is the probability of choosing E or S?

A. $\frac{3}{5}$ B. $\frac{1}{3}$ C. $\frac{1}{2}$ D. $\frac{2}{5}$

Year 9

One and Two Stage Chance Events Test

Calculator

Short Answer Section

Name : _____

Write all working and answers in the spaces provided on this test paper.

Questions 1 to 4 refer to the table below.
Jack asked 50 friends what their favourite film genre was.

Film Genre	Frequency	Relative Frequency
Thriller	11	0.22
Romance	14	0.28
Comedy	18	0.36
Drama	5	
Horror	2	0.04

1. What is the relative frequency for Drama?

Drama = $1 - 0.9 = 0.1$

2. If one person is chosen at random, what is the probability that their favourite is Thrillers or Horror?

$P(T \text{ or } H) = 0.22 + 0.04$

$= 0.26$

3. If one person is chosen at random, what is the probability that their favourite isn't Romance?

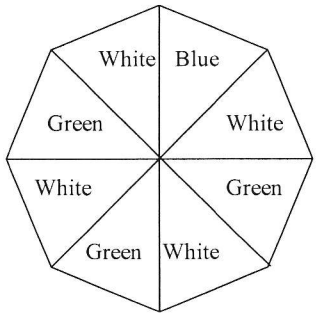
$P(R) = 0.28$ $P(\tilde{R}) = 1 - 0.28$

$= 0.72$

4. If one person is chosen at random, what is the probability that that their favourite isn't Thrillers of Horror?

$P(\tilde{T \text{ or } H}) = 1 - 0.26 = 0.74$

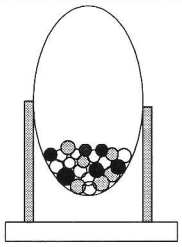
5. A spinner in a board game is in the shape of an octagon, with each section white, blue or green, as shown. On one spin, what is the probability that the pointer doesn't stop on green?



$P(G) = \frac{3}{8}$

$P(\tilde{G}) = \frac{5}{8}$

Questions 6 – 8 refer to the following information.
In a game of Lotto 42 different coloured balls placed in a container.
We know that 12 are red, 18 are black and the rest are yellow.



One ball is drawn out.

5. What is the probability that it is yellow?

$n(Yellow) = 42 - (12+18) = 12$

$P(Y) = \frac{12}{42} = \frac{2}{7}$

6. What is the probability that it is not black?

$P(\overline{B}) = 1 - \frac{18}{24} = 1 - \frac{3}{7}$

$= \frac{4}{7}$

7. What is the probability that it is red or black?

$P(R \text{ or } B) = \frac{30}{42} = \frac{5}{7}$

Question 8 – 10 refer to the following:
Two normal six sided dice are rolled in a board game. Jamie-Lee starts to draw up a table to show the possible outcomes.

	1	2	3	4	5	6
1	1,1	2,1	3, 1	4, 1	5, 1	6, 1
2	1,2	2,2	3, 2	4,2	5, 2	6, 2
3	1,3	2,3	3, 3	4,3	5, 3	6, 3
4	1,4	2,4	3, 4	4,4	5, 4	6, 4
5	1,5	2,5	3, 5	4,5	5, 5	6, 5
6	1,6	2,6	3, 6	4,6	5, 6	6, 6

8. Complete the table for her.

9. To start the game she needs a double (both dice showing the same number). What is the probability of rolling a double on her first turn?

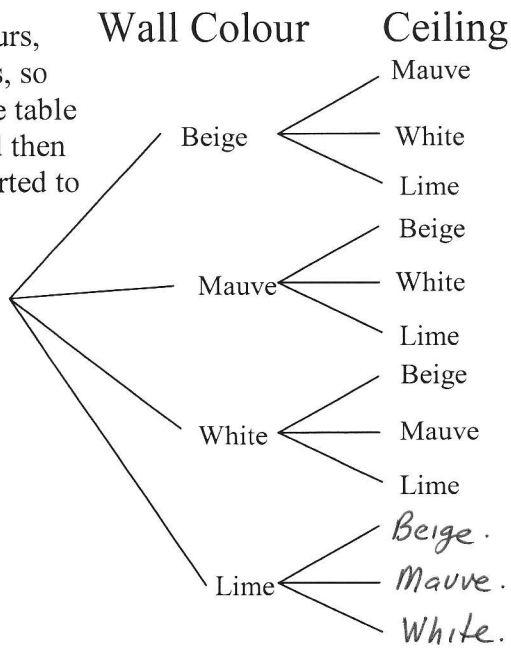
$P(Double) = \frac{6}{36} = \frac{1}{6}$

10. To finish she needs to roll a total of 8. What is the probability that she rolls 8 on her first attempt?

$P(8) = \frac{5}{36}$

Questions 11 – 14 refer to the following.

When planning to paint her room using 2 colours, Leica cannot make up her mind from 4 colours, so she puts the 4 colour samples face down on the table and randomly chooses the wall colour first and then the ceiling colour. A tree diagram has been started to show the possible combinations.



11. Complete the tree diagram.

12. What is the probability that she has Beige on the walls and Lime on the ceiling?

$P(BL) = \frac{1}{12}$

13. What is the probability that the two colours are Beige and Lime in either combination?

$P(BL \text{ or } LB) = \frac{2}{12} = \frac{1}{6}$

14. What is the probability that White is not one of the colours?

$P(\text{not white}) = \frac{6}{12} = \frac{1}{2}$

One and Two Stage Chance Events Test

Year 9

Calculator

Multiple Choice Section

Name : _____

Mark all your answers on the accompanying multiple choice answer sheet, not on this test paper. You may do any working out on this test paper. Calculators are allowed for this section.

1. In a chess tournament, Vlad is given a 60% chance of winning. The other four players Costa, Ivana, Katarina and Sven are equally likely to win. What is the probability that Katarina wins the tournament?

A. 5% B. 10% C. 20% D. 40%

Questions 2 and 3 refer to the following:
Athletes are measured for dehydration at the end of a distance event and asked if they drank water on the way. The results are shown in the table.

	Drinks Water	Doesn't drink Water	Total
Suffers Dehydration	12	11	23
Doesn't suffer dehydration	26	1	27
Total	38	12	50

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2. Based on these results, the probability of suffering dehydration if you drink water is:

A. $\frac{6}{13}$ B. $\frac{6}{25}$ C. $\frac{6}{19}$ D. $\frac{23}{50}$

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3. Which statement is incorrect?

A. If you drink water you still have close to a 1 in 3 chance of suffering dehydration.
B. If you drink water you are more likely to suffer dehydration.
C. You are almost certain to suffer dehydration if you don't drink water.
D. You can reduce the likelihood of suffering dehydration of you drink water.

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4. Which of the following always has a probability of $\frac{2}{3}$?

A. Drawing a blue card from a pack of 6 blue and 9 red cards.
B. Jo or Sue winning a running race with only three competitors.
C. Rolling a number less than 5 on a standard die.
D. Rolling a number greater than 3 on a standard die.

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5. After 4 rolls of a normal die, a 6 has appeared each time. What is the probability that a 6 will appear on the 5th roll?

A. $\frac{1}{12}$ B. $\frac{1}{6}$ C. $\frac{1}{3}$ D. $\frac{2}{3}$

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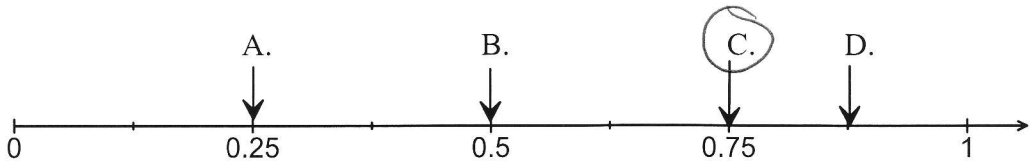
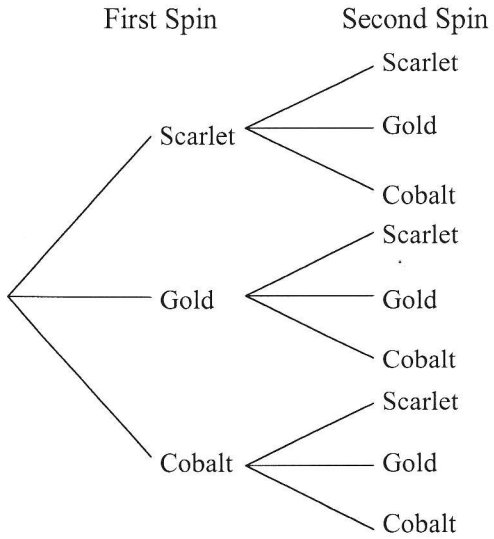
6. A container holds 9 red marbles, 2 green marbles and 1 purple marble.
Which point on the number line would represent the probability of drawing a red marble from the container?



Questions 7 – 9 refer to the following.
A spinner has three colours; scarlet, gold and cobalt. In a role play game, it is spun twice for each turn. The tree diagram shows the possible outcomes.



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7. What is the probability that both spins land on the same colour?

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

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8. What is the probability that at least one of the spins lands on gold?

A. $\frac{1}{9}$ B. $\frac{1}{3}$ C. $\frac{4}{9}$ D. $\frac{5}{9}$

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9. What is the probability that Scarlet is not one of the colours it lands on in either spin?

A. $\frac{1}{9}$ B. $\frac{1}{3}$ C. $\frac{4}{9}$ D. $\frac{5}{9}$

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10. A four sided die is rolled twice. The possible outcomes are:

1,1 1,2 1,3 1,4 2,1 2,2 2,3 2,4
3,1 3,2 3,3 3,4 4,1 4,2 4,3 4,4

What is the probability that the total of the dice is less than 6?

A. $\frac{1}{8}$ B. $\frac{3}{8}$ C. $\frac{5}{8}$ D. $\frac{7}{8}$

Year 9

One and Two Stage Chance Events Test

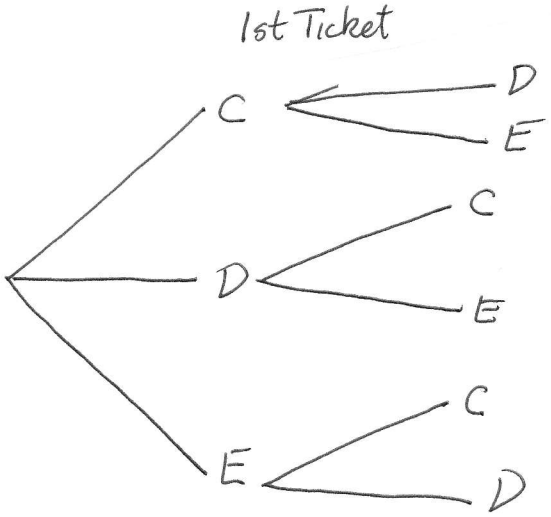
Longer Questions

Calculator

Name : _____

Write all working and answers in the spaces provided on this test paper.
Calculators are allowed for this section.

1. (a) (2 marks) A group of 3 friends have two tickets for a concert. They write their names (Casey, Deanne and Eloise) on slips of paper and draw two names out to see who uses the tickets. Draw a tree diagram to show the possible outcomes.



(b) (1 mark) What is the probability that Casey and Eloise are chosen (in any order)? *

..... 2/6 = 1/3 .....

.....

(c) (1 mark) What is the probability that Eloise is not chosen? O

..... 2/6 = 1/3 .....

.....

2. (a) (2 marks) A computer technician analyses his recent callouts and comes up with the two way table that indicates if a problem was with the software or hardware, and whether it could be repaired onsite or needed to go back to the workshop. Complete the totals for the table.

	Software problem	Hardware problem	TOTALS
Fixed onsite	23	8	31
Taken to workshop	7	12	19
TOTALS	30	20	50

He uses the table to work out probabilities of certain outcomes.

(b) (1 mark) What is the probability that a callout is a hardware problem that can be fixed onsite?

$P(H \text{ Onsite}) = \frac{8}{50} = \frac{4}{25}$

(c) (1 mark) Given that a callout is a hardware problem, what is the probability that it can be fixed onsite?

$P(\text{Onsite given } H) = \frac{8}{20} = \frac{2}{5}$