High School
Mathematics Test 2013
Basic Probability

Year 9

Skills and Knowledge Assessed:
- Identify complementary events and use the sum of probabilities to solve problems (ACMSP204)
- Describe events using language of 'at least', exclusive 'or' (A or B but not both), inclusive 'or' (A or B or both) and 'and'. (ACMSP205)
- Represent events in two-way tables and Venn diagrams and solve related problems (ACMSP292)
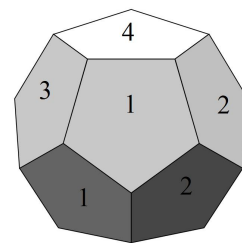
Name_____

Section 1   Short Answer Section

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

1. Kesia collects troll dolls which she keeps in a basket in her room. There are 8 blue ones, 5 green ones and 7 yellow ones. If she picks one out of her basket at random, what is the probability that it is blue?

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2. A dice in a role play game has 12 faces. Six faces are coloured red and are numbered 1 to 6 and the other six faces are coloured white and also numbered 1 to 6. When the dice is rolled, what is the probability that an even number coloured red appears uppermost?
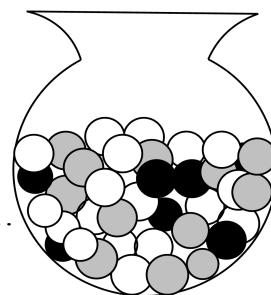
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3. Hazel writes the names of the days of the week on slips of paper and places them in a bowl. When she draws one slip at random, what is the probability that the name does not contain the letter U?

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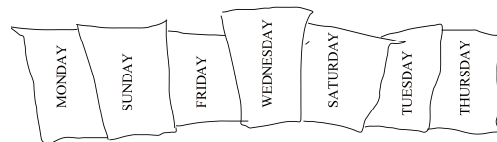
4. A vase holds coloured 30 marbles. Eight are coloured red, twelve are coloured white and the rest are blue. If one is chosen at random, what is the probability that it is not white?

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5.   If one letter is selected at random from those making up the word SALUTATION, what is the
      probability that it is not a T or an A?

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6.   The table below shows the number of students who lived in each of three residences in a university.

Residence	Donaldson Dormitory	Harrison House	Quartermain Quarters
Number of students	125	127	148

      A student is chosen at random from those who live in the residences. What is the probability that the
      student does not come from Donaldson Dormitory?

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      ....

      Questions 7 – 8 refer to the two way table below which shows the numbers of males and females in a
      survey who were carrying a mobile phone when interviewed.

	Male	Female	Total
Carrying Phone	12	24	36
Not Carrying Phone	22	10	32
Total	34	34	

7.   One of the people who took part in the survey is chosen at random. What is the probability that the
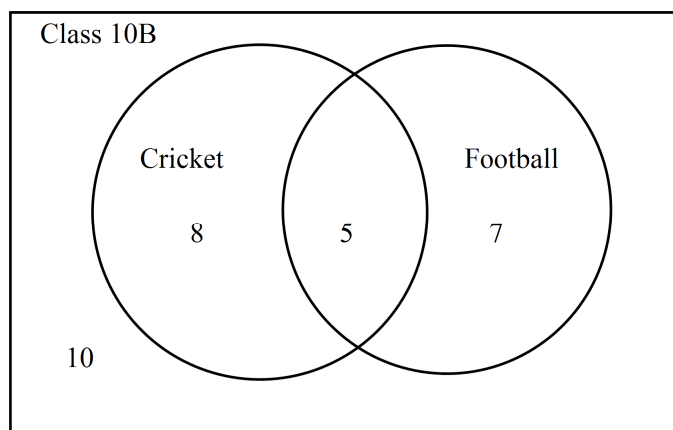   person was a male who was carrying a phone?

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8.   One of the people who were not carrying a phone is chosen at random. What is the probability that the
      person is a female?

      ……………………………………………………………………………………………….

      ……………………………………………………………………………………………..

Questions 9 – 10 refer to the Venn diagram shown below which shows the numbers of students in Class 10B who played cricket and football.

9.   A student from Class 10B is chosen at random. What is the probability that the student plays both football and cricket?

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10.   A student from Class 10B is chosen at random. What is the probability that the student does not play cricket?

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Section 2   Multiple Choice Section

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. The spinner shown has some black sectors, some white sectors and some grey sectors. When it is spun, what is the probability that it lands on a black sector?

    A. $\dfrac{1}{4}$ B. $\dfrac{1}{3}$

    C. $\dfrac{5}{12}$ D. $\dfrac{5}{7}$
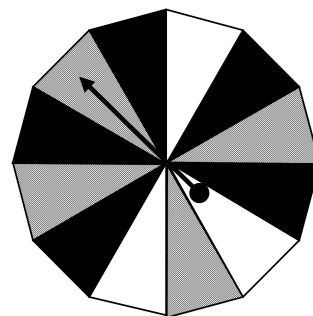
2. A bridge opens once every hour of the day for ten minutes and is closed to traffic during this time. When a car approaches the bridge at a random time, what is the probability that the bridge will be open?

    A. $\dfrac{1}{6}$ B. $\dfrac{1}{5}$ C. $\dfrac{4}{5}$ D. $\dfrac{5}{6}$

3. When a normal coin is tossed 80 times, how many times would you expect it to come up heads?

    A. 20   B. 40   C. 60   D. 80

4. An event has a probability of $\dfrac{1}{200}$ of occurring. Which term might be accurately used to describe the likelihood of the event?

    A. Likely   B. Unlikely   C. Very Likely   D. Very Unlikely

5. A jewellery bag contains eight red, four blue, two green and six pink charms. One charm is selected at random. What is the probability that it is not blue or green?

    A. $\dfrac{1}{10}$ B. $\dfrac{3}{10}$ C. $\dfrac{7}{10}$ D. $\dfrac{9}{10}$

6. There are 60 knives in a drawer. Sixteen of these have steel handles, thirteen have wooden handles, eighteen have plastic handles and the rest have bamboo handles. Which two types of handles have the same probability of being chosen when one knife is taken from the drawer?

    A.   Bamboo and Wooden   B.   Plastic and Wooden

    C.   Steel and Plastic   D.   Steel and Wooden

7. What is the probability of not rolling a number less than 6 on a single roll of a die?

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

8. In a game of chance, the probability of winning is $\dfrac{17}{50}$ and the probability of a draw is $\dfrac{1}{5}$.

What is the probability of not winning?

    A. $\dfrac{23}{50}$ B. $\dfrac{33}{50}$ C. $\dfrac{4}{5}$ D. $\dfrac{43}{50}$

Questions 9 and 10 refer to the table below, which shows how people of different ages performed on a test of various Information Technology skills.

	Aged twenty or more	Aged less than twenty	Total
Passed IT test	45	35	80
Failed IT test	17	23	40
Total	62	58	120

9. If a person who did the test was chosen at random, what is the probability that they were aged less than twenty and passed the test?

    A. $\dfrac{23}{120}$ B. $\dfrac{7}{24}$ C. $\dfrac{9}{24}$ D. $\dfrac{7}{16}$

10. If a person who passed the test was chosen at random, what is the probability that they were aged less than twenty?

    A. $\dfrac{7}{24}$ B. $\dfrac{9}{24}$ C. $\dfrac{9}{16}$ D. $\dfrac{7}{16}$

Questions 11 – 12 refer to the Venn diagram which compares the voting preferences and the occupations of a survey group of 120 voters.

Survey Group

Voted for the Government

16

Work for the Pubic Service

24

28

52
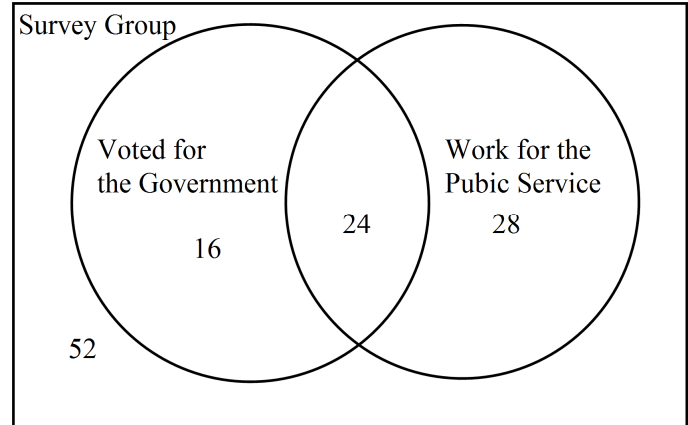
11.   A person is chosen at random from the survey group. What is the probability that they worked for the Public Service?

A. $\dfrac{1}{5}$
B. $\dfrac{7}{30}$
C. $\dfrac{13}{30}$
D. $\dfrac{6}{7}$

12.   A person is chosen at random from the survey group. What is the probability that they didn't vote for the government?

A. $\dfrac{7}{30}$
B. $\dfrac{7}{13}$
C. $\dfrac{13}{15}$
D. $\dfrac{2}{3}$

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Multiple Choice Answer Sheet

Name _____

Completely fill the response oval representing the most correct answer.

1. A ◯ B ◯ C ◯ D ◯
2. A ◯ B ◯ C ◯ D ◯
3. A ◯ B ◯ C ◯ D ◯
4. A ◯ B ◯ C ◯ D ◯
5. A ◯ B ◯ C ◯ D ◯
6. A ◯ B ◯ C ◯ D ◯
7. A ◯ B ◯ C ◯ D ◯
8. A ◯ B ◯ C ◯ D ◯
9. A ◯ B ◯ C ◯ D ◯
10. A ◯ B ◯ C ◯ D ◯
11. A ◯ B ◯ C ◯ D ◯
12. A ◯ B ◯ C ◯ D ◯

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ANSWERS

Section 1	
1.	$P(B) = \dfrac{8}{20} = \dfrac{2}{5}$
2.	$P(\text{Red and Even}) = \dfrac{3}{12} = \dfrac{1}{4}$
3.	$P(\text{Does not contain U}) = \dfrac{3}{7}$
4.	$P(\text{Not white}) = 1 - P(\text{White}) = 1 - \dfrac{12}{30} = 1 - \dfrac{2}{5} = \dfrac{3}{5}$
5.	$P(\text{T or A}) = \dfrac{4}{10} = \dfrac{2}{5}$ $P(\text{not T or A}) = 1 - \dfrac{2}{5} = \dfrac{3}{5}$
6.	$P(\text{Not from D}) = 1 - \dfrac{125}{400} = \dfrac{275}{400} = \dfrac{11}{16}$
7.	$P(\text{Male carrying a phone}) = \dfrac{12}{68} = \dfrac{3}{17}$
8.	$P(\text{Female given no phone}) = \dfrac{10}{32} = \dfrac{5}{16}$
9.	$P(\text{Both cricket and Football}) = \dfrac{5}{30} = \dfrac{1}{6}$
10.	$P(\text{Not play cricket}) = 1 - P(\text{Play cricket}) = 1 - \dfrac{13}{30} = \dfrac{17}{30}$

Section 2	
1.	C
2.	D
3.	B
4.	D
5.	C
6.	A
7.	A
8.	B
9.	B
10.	D
11.	C
12.	D

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Multiple Choice Answer Sheet

Name____ <u>Marking Sheet</u>

Completely fill the response oval representing the most correct answer.

1.	A ◯	B ◯	C ●	D ◯
2.	A ◯	B ◯	C ◯	D ●
3.	A ◯	B ●	C ◯	D ◯
4.	A ◯	B ◯	C ◯	D ●
5.	A ◯	B ◯	C ●	D ◯
6.	A ●	B ◯	C ◯	D ◯
7.	A ●	B ◯	C ◯	D ◯
8.	A ◯	B ●	C ◯	D ◯
9.	A ◯	B ●	C ◯	D ◯
10.	A ◯	B ◯	C ◯	D ●
11.	A ◯	B ◯	C ●	D ◯
12.	A ◯	B ◯	C ◯	D ●