$\qquad$
$\qquad$

1. The table below shows the relative frequencies of the ages of the students at Ingham High School.

| Age <br> (in years) | Relative <br> frequency |
| :---: | :---: |
| 13 | 0.11 |
| 14 | 0.30 |
| 15 | 0.23 |
| 16 | 0.21 |
| 17 | 0.15 |
| Total | 1 |

(a) If a student is randomly selected from this school, find the probability that
(i) the student is 15 years old;
(ii) the student is 16 years of age or older.

There are 1200 students at Ingham High School.
(b) Calculate the number of 15 year old students.

## Working:

Answers:
(a) (i)
(ii)
(b)
2. The table below shows the number of left and right handed tennis players in a sample of 50 males and females.

|  | Left handed | Right handed | Total |
| :--- | :---: | :---: | :---: |
| Male | 3 | 29 | 32 |
| Female | 2 | 16 | 18 |
| Total | 5 | 45 | 50 |

If a tennis player was selected at random from the group, find the probability that the player is
(a) male and left handed;
(b) right handed;
(c) right handed, given that the player selected is female.

Working:

Answers:
(a)
(b)
(c)
3. Note: For this question, it is important that you show your working and explain your method clearly.

A box contains 10 coloured light bulbs, 5 green, 3 red and 2 yellow. One light bulb is selected at random and put into the light fitting of room A.
(a) What is the probability that the light bulb selected is
(i) green?
(ii) not green?

A second light bulb is selected at random and put into the light fitting in room $B$.
(b) What is the probability that
(i) the second light bulb is green given the first light bulb was green?
(ii) both light bulbs were not green?
(iii) one room had a green light bulb and the other room does not have a green light bulb?

A third light bulb is selected at random and put in the light fitting of room C .
(c) What is the probability that
(i) all three rooms have green light bulbs?
(ii) only one room has a green light bulb?
(iii) at least one room has a green light bulb?
4. Nene and Deka both play netball. The probability that Nene will score a goal on her first attempt is 0.75 . The probability that Deka will score a goal on her first attempt is 0.82 .

Calculate the probability that
(a) Nene and Deka will both score a goal on their first attempts;
(b) neither Nene nor Deka will score a goal on their first attempts.

## Working:

Answers:
(a)
(b)
(Total 4 marks)
5. In a club with 60 members, everyone attends either on Tuesday for Drama ( $D$ ) or on Thursday for Sports $(S)$ or on both days for Drama and Sports.

One week it is found that 48 members attend for Drama and 44 members attend for Sports and $x$ members attend for both Drama and Sports.
(a) (i) Draw and label fully a Venn diagram to illustrate this information.
(ii) Find the number of members who attend for both Drama and Sports.
(iii) Describe, in words, the set represented by $(D \cap S)^{\prime}$.
(iv) What is the probability that a member selected at random attends for Drama only or Sports only?

The club has 28 female members, 8 of whom attend for both Drama and Sports.
(b) What is the probability that a member of the club selected at random
(i) is female and attends for Drama only or Sports only?
(ii) is male and attends for both Drama and Sports?
6. Two jars contain a number of coloured balls as indicated in the diagrams below.


Jar One


Jar Two

Two experiments are carried out.
First Experiment: A jar is first chosen at random and then a ball is drawn from that jar.
(a) Draw, and label fully, a tree diagram to show all possible outcomes of this experiment.
(b) What is the probability that a white ball is drawn?

Second Experiment: The ball drawn in the first experiment is not replaced. A second ball is then drawn from the same jar.
(c) What is the probability that both balls are white?
7. A bag contains two red sweets and three green sweets. Jacques takes one sweet from the bag, notes its colour, then eats it. He then takes another sweet from the bag.

Complete the tree diagram below to show all probabilities.


Working:
(Total 4 marks)
8. The sets $A, B$ and $C$ are subsets of $U$. They are defined as follows:
$U=\{$ positive integers less than 16$\}$
$A=\{$ prime numbers $\}$
$B=\{$ factors of 36\}
$C=\{$ multiples of 4$\}$
(a) List the elements (if any) of the following:
(i) $A$;
(ii) $B$;
(iii) $C$;
(iv) $A \cap B \cap C$.
(b) (i) Draw a Venn diagram showing the relationship between the sets $U, A, B$ and $C$.
(ii) Write the elements of sets $U, A, B$ and $C$ in the appropriate places on the Venn diagram.
(c) From the Venn diagram, list the elements of each of the following
(i) $A \cap(B \cup C)$;
(ii) $\quad(A \cap B)^{\prime}$;
(iii) $(A \cap B)^{\prime} \cap C$.
(d) Find the probability that a number chosen at random from the universal set $U$ will be
(i) a prime number;
(ii) a prime number, but not a factor of 36 ;
(iii) a factor of 36 or a multiple of 4 , but not a prime number;
(iv) a prime number, given that it is a factor of 36 .

