1. I need a number of tools for my gardening. The price list in the hardware shop shows that the prices of the tools I need are as follows:

- a spade £1.70; a fork £1.95; a hoe £0.75; a rake £0.70; a hedge shear £2.10;
- a lawn-mower £8.25; a watering can £0.80; a wheelbarrow £7.00; a pruning knife £1.50;
- a water-hose £1.30, and a hand-sprayer £0.95.

What is the total cost of all the things I need? If 10% tax is then added, what is my total bill?

2. (a) Use logarithms or a slide rule to evaluate \(\frac{19.5 \times 9.55}{30.9}\).

(b) Write out, in correct order, the first ten natural numbers in the base four (fours system).

[NOTE: The set of natural numbers is \(\{0, 1, 2, 3, \ldots\}\)]

3. (a) The diagram shows the elements of the sets A and B in the universe, \(U\). List the elements of each of the following sets:

- (i) \(U\)
- (ii) \(B\)
- (iii) \(A \cap B\)
- (iv) \(A \cup B\)
- (v) \(B / A\)
- (vi) \(A'\)

(b) In a survey of a class of 24 boys, 14 of the boys said that they play basketball, 6 boys said they play tennis, and 12 boys said they play volleyball. Of the boys who play tennis, 3 also play volleyball, and 2 play basketball. Seven of those who play basketball also play volleyball. Only one boy plays all three of the games.

Represent the results of the survey on a single Venn diagram and find out how many of the boys in the class play none of the three games mentioned.

4. There are 540 boys in a school. A survey on a Wednesday afternoon showed that 150 were playing Gaelic Football, 120 were taking part in a Soccer tournament, 60 boys were playing Hurling, and 90 boys were playing in a Volleyball competition. All the remaining boys were rehearsing for the Music and Drama Society productions. Illustrate the information given above as accurately as you can on a pie-chart.

(You are advised to use a reasonably large circle.)

5. Find the solution set of each of the following:

(i) \(3(2x + 5) - 4(3x + 2) = 18 - 7(2x - 3)\).

(ii) \(\frac{1}{3}x + 4y = 17\)

\(3x + y = 18\).
6. The figure $abcd$ represents a rhombus (i.e., a parallelogram with all sides of equal length). The diagonals of the rhombus intersect at the point $k$. The measure of each of the angles $abc$ and $acd$ is $120^\circ$. $L$ is the line $ac$ and $M$ is the line $bd$. $S_L$ denotes the axial (line) symmetry with axis $L$, $S_M$ denotes the axial (line) symmetry with axis $M$, and $S_k$ denotes the central (point) symmetry of centre $k$.

(a) What is the image of the point $d$ (i) by $S_L$, (ii) by $S_M$, (iii) by $S_k$, (iv) by the translation $\mathbf{ab}$?

(b) What is the image of the line segment $[ab]$ (i) by $S_L$, (ii) by $S_M$, (iii) by $S_k$, (iv) by the translation $\mathbf{de}$?

(c) What is the measure of (i) the angle $abd$, (ii) the angle $acd$?

7. (a) Graph the elements of each of the following sets on a separate number line:

(i) $A = \{x | x \in \mathbb{N}, 0 < x < 5\}$

(ii) $B = \{x | x \in \mathbb{Z}, -4 \leq x < 2\}$

[NOTE: $\mathbb{N} = \{0, 1, 2, 3, ...\}$ and $\mathbb{Z} = \{..., -2, -1, 0, 1, 2, ...\}$]

(b) Draw up a table of the ordered pairs $(x, y)$ such that $y = 2x + 5$ where $x$ and $y$ are integers and $-3 \leq x \leq 1$. Graph this set of ordered pairs (couples) on the squared paper provided.

8. (a) In testing the petrol consumption of my car I found that I could travel 1500 kilometres on $\£10$ worth of petrol. The petrol costs $8p$ per litre. How many kilometres per litre do I get from my car?

(b) I work a 44-hour week and my pay rate is $60p$ per hour. I get $1 \frac{1}{2}$ times normal rate for overtime. What will my wages be for a week in which I worked a total of 48 hours?