1 Write the answer to each of the following in standard form:

(a) $50\,000 \times 2400$.  
(b) $9000 \div 1\,200\,000$.  

2 Cubes are stacked on a desk against a wall as shown in the diagram. The visible surface of each stack is then painted. The number of painted squares in each stack is given in the table:

<table>
<thead>
<tr>
<th>Stack</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Painted squares</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>?</td>
</tr>
</tbody>
</table>

(a) How many painted squares will be in the $4^{th}$ stack?  
(b) The formula for finding the number of painted squares is $C = 3n + 1$, where $n$ is the stack number.  

Calculate the number of painted squares if $n = 13$.  
(c) Find the stack number if it has 25 painted squares.  

3 Simplify each of the following:

(a) $\frac{\sqrt[3]{3}^{3}}{8}$. (Write your answer as a fraction)  
(b) $\sqrt{9 + 6}$.  
(c) $\left(4a^{4}\right)$.  

[4]
4 A company sells beans in 450 gram tins. They also sell beans in 630 gram tins. The price per gram is the same for both packagings.

(a) Express the mass of the small tin as a fraction of the mass of the large tin. Write the fraction in simplest form. [1]

(b) Calculate:
(i) the price for the small tin. [2]
(ii) the percentage increase from 450 g to 630 g. [3] [6]

5 Ronnie invests N$ 2 500 in a Namibian building society, at an annual rate of 9% compound interest. He wants to know how much his money will be worth in 3 year's time.

Copy the following table in your answer book and calculate the amount that Ronniewill have in three year's time. The first year has already been calculated.

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount at start of year</th>
<th>Interest</th>
<th>Total amount at year end</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N$ 2 500</td>
<td>2 500 x 0.09 = 225</td>
<td>2 500 + 225 = 2 725</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>[3]</td>
</tr>
</tbody>
</table>
6 Study the information in the following table:

<table>
<thead>
<tr>
<th>Taxable amount</th>
<th>Rates of tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>N$ 24 000 or less</td>
<td>No tax payable</td>
</tr>
<tr>
<td>Between N$ 24 000 and N$ 40 000</td>
<td>17.5% of (Taxable amount minus N$ 24 000)</td>
</tr>
<tr>
<td>Between N$ 40 000 and N$ 80 000</td>
<td>N$ 2 800 + 29.5% of (Taxable amount minus N$ 40 000)</td>
</tr>
<tr>
<td>Between N$ 80 000 and N$ 200 000</td>
<td>N$ 14 600 + 34.5% of (Taxable amount minus N$ 80 000)</td>
</tr>
<tr>
<td>More than N$ 200 000</td>
<td>N$ 56 000 + 35% of (Taxable amount minus N$ 200 000)</td>
</tr>
</tbody>
</table>

Erica earns a total income of N$ 85 000 per year. She does not pay taxes on the following amounts (Tax deductibles) per year:

- N$ 3 000 Medical Aid
- N$ 9 600 Pension Fund
- N$ 4 200 Annuity.

(a) Give the total amount for Erica's Tax deductibles. [1]

(b) Subtract the Tax deductibles from her total income per year and write it down. This answer is her Taxable amount. [1]

(c) Copy, from the table, the correct rate for the tax (the formula) that she has to pay. [1]

(d) Use the formula to calculate the amount of tax that Erica has to pay. [3]

7 Carol fits a regular battery into her CD-player.
The regular battery costs N$ 19.20 and lasts for 320 hours.
She replaces it with a long life battery which costs N$ 30.00 and lasts for 600 hours.

(a) Find the cost per hour for each type of battery. [2]

(b) Calculate the time per N$, in hours, for each type of battery. [2]

(c) Which type of battery is the best buy? [1]
8 A pump is used to fill a cylinder with water. The height of the water level is measured every 5 seconds.

The table shows the results obtained:

<table>
<thead>
<tr>
<th>Height of water (mm)</th>
<th>21</th>
<th>42</th>
<th>?</th>
<th>84</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken (seconds)</td>
<td>5</td>
<td>10</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

(a) Find the flow rate of the water in millimetres per second. [1]
(b) Calculate the height of the water after 15 seconds. [1]
(c) How long will it take the water level to reach 378 millimetres? Give your answer in minutes. [2]
(d) The cylinder has a radius of 14 cm and a height of 60 cm. Calculate the volume of the cylinder. \( (\pi = \frac{22}{7}) \) [3]

9 In the diagram a circle fits precisely inside a square. The diameter of the circle is 14 cm.

(a) Calculate the area of the circle. \( (\pi = \frac{22}{7}) \) [2]
(b) Find the area of the square. [2]
(c) Calculate the shaded area. [1]
(d) Find the perimeter of the square. [1]
10  (a) Simplify the expression
\[ 3x^2 + 5xy + 4x^2 - 9xy. \]  
(b) Remove the brackets and simplify the expression
\[ 9a(2a^2 - 3ab - 1). \]

11  5 Boxes of Smarties plus 3 Candy Hearts have the same mass as 2 boxes of Smarties plus 7 Candy Hearts. Each box of Smarties has a mass of \( x \) g and each Candy Heart has a mass of 60 g.

(a) Use the information and write an equation in terms of \( x \).
(b) Find \( x \), the mass of one box of Smarties.

12  All measures on both axes of the following Cartesian plane are in centimetres.

(a) Find the \( y \)-intercept of the line through \( C \) and \( D \).
(b) Read from the graph the lengths of \( a \), \( b \) and \( h \).
(c) Calculate the area of the trapezium \( ABCD \) in cm\(^2\).
13 The table shows the number of hours worked by a group of workers in a day.

<table>
<thead>
<tr>
<th>Number of hours</th>
<th>Number of workers</th>
<th>number of hours worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) Which number of hours was worked most frequently (the mode)?

(b) Determine
   (i) the total number of workers.
   (ii) the total number of hours worked.

(c) Calculate the mean number of hours worked, correct to one decimal place.

14 In a 560 millilitre bottle of fruit juice 14 out of 35 parts is apple juice. The remaining parts are strawberry juice.

(a) Write the ratio of apple juice to strawberry juice in simplest form.

(b) Express the strawberry juice as a percentage of the mixture.

(c) Calculate the amount of apple juice per bottle in millilitres.

15 The diagram shows a parallelogram.

Find the size of angle

(a) a.

(b) b.

(c) c.

(d) d.
16 In the diagram $PR$ is the diameter of the circle with centre $O$. Angle $POQ = 140^\circ$ and angle $PRS = 55^\circ$.

(a) Give the size of angle $RSP$. [1]

(b) Calculate the size of angle $SPR$. [2]

(c) Find the size of angle $RPQ$. [2] [5]

17 Study the Cartesian plane.

(a) Fully describe the transformation that maps figure $S$ onto figure $R$. [2]

(b) Describe the transformation that maps figure $R$ onto figure $T$. [3] [5]
Use the information in the diagram to calculate:

(a) the length of side $x$.  

(b) the length of side $y$.  

(c) the size of angle $\theta$.  

$$\sin 24,6^\circ = 0,42$$  
$$\cos 65,4^\circ = 0,42$$  
$$\tan 22,6^\circ = 0,42$$  

[TOTAL: 90]