1. (i) Add $42^\circ 52'$ and $18^\circ 28'$.

(ii) Calculate the value of $x$ in the diagram.

(iii) $abcd$ is a parallelogram and $pq \parallel ab$.
Name two angles each having the same measure as $\angle abc$.

(iv) $[ps]$ and $[qr]$ are diameters of the circle with centre $o$.
Find the image of $[pq]$ under the central symmetry in the point $o$.

(v) $ab \parallel cd$, $1 \angle abc = 40^\circ$
and $1 pc = 1 pd$.
Name another angle which measures $40^\circ$.
Hence, calculate $1 \angle bpd$.
(vi) \(abcd\) and \(acpd\) are parallelograms.  
Under the translation \(b\vec{c}\),  
write down the image of  
(i) \(\triangle abc\)  
(ii) \([ac]\).

(vii) \(L\) and \(M\) are parallel lines.  
Find the value of \(x\) and the value of \(y\).

(viii) In the triangle \(abc\), \(\lvert ab \rvert = \lvert bc \rvert\) and \(\angle abc = 90^\circ\).  
If \(\lvert ab \rvert = \sqrt{8}\), calculate \(\lvert ac \rvert\).

(ix) The image of a line under a translation is a parallel line.  
Find the equation of the image of the line \(y = 3x - 5\) under the translation \((0, -5) \rightarrow (3, -5)\).  

[Equation of line is \(y - y_1 = m (x - x_1)\) or \(y = mx + c\)].

(x) If \(\tan A = 0.4411\), use the book of Tables to find \(\cos A\).

2.  
(a) A youth club collects the same membership fee from each of its 140 members.  
15% of the club’s members have still to pay their membership fee.  
How many club members have not paid their fee?

If the fees not yet paid amount to \(\text{IRE}50.40\) in total, calculate the membership fee for each club member.

(b) The internal dimensions, length, width and height, of a rectangular box are in the ratio \(1:1:4\), respectively.

If the internal length of the box is 20 cm, find its width and height.

Calculate the capacity (internal volume) of the box in \(\text{cm}^3\).

Spheres, each of radius length 5 cm, are packed into the box.  
Calculate the maximum number of spheres that the box can contain.
3. \(pqrs\) is a square and \(pacs\) is a parallelogram where \(\mid aq \mid = \mid qc \mid = \mid cr \mid\).

(i) Find the image of the triangle \(paq\) under the translation \(\vec{ac}\).

(ii) Name two line segments each equal in length to \([ac]\).

(iii) If \(\mid pq \mid = 4\), show that \(\mid pa \mid = \sqrt{20}\).

(iv) Calculate the area of the figure \(pqcs\).

(v) Prove that 
\[\mid \angle scq \mid = \mid \angle apq \mid + \mid \angle pqa \mid.\]

4. Diameters \([ac]\) and \([bd]\) intersect at \(o\), the centre of the circle.

(i) Name two angles each having the same measure as \(\angle dao\).

(ii) Find the image of the triangle \(abc\) under the central symmetry in the point \(o\).

(iii) Say why triangles \(aob\) and \(doc\) are congruent.

(iv) If the area of the circle is 314, calculate its radius length, taking \(\pi = 3.14\).

(v) If \(\mid \angle bao \mid = 60^\circ\), prove that \(\mid ab \mid = \mid ob \mid\).

OVER \(\rightarrow\)
The point \( p \ (4, 5) \) is shown.

(i) Copy the diagram and plot the point \( q \ (-2, 2) \).

(ii) Show that \( |pq| = \sqrt{45} \).

(iii) Find the slope of \( pq \).

(iv) Find the equation of \( pq \).

(v) \( pq \) cuts the \( y \) axis at the point \( d \ (0, y) \).
Calculate the value of \( y \).
Hence, find the area of the triangle \( dpr \), where \( r \) is the point \( (0, 5) \).

[Distance formula: \( \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \).]

Slope formula: \( m = \frac{y_2 - y_1}{x_2 - x_1} \).

Equation of line: \( y - y_1 = m \ (x - x_1) \) or \( y = mx + c \).]

6. (a) Use the book of Tables to find

(i) \( \sin 30^\circ \)

(ii) \( \sin 54^\circ \ 06' \).

(b) In the triangle \( abc \), \( | \angle bca | = 90^\circ \), 
\( | ab | = 10 \) and \( | bc | = 8.1 \).

(i) Find \( \sin \angle bac \).

(ii) Find the measure of \( \angle abc \).

(iii) Calculate \( |ac| \), giving your answer correct to one place of decimals.

(c) \( [qr] \) and \( [mn] \) are two vertical poles standing on level ground \( pn \).

\( | \angle qpr | = 31^\circ \ 48' \) and \( | pr | = 40 \) m.

(i) Calculate \( | qr | \).

(ii) If \( | mn | = 31 \) m, calculate \( | rm | \).