# AN ROINN OIDEACHAIS

## LEAVING CERTIFICATE EXAMINATION, 1992

MATHEMATICS – ALTERNATIVE – ORDINARY LEVEL

SAMPLE PAPER II (300 marks) – 2 ½ hours

Attempt **QUESTION 1** (100 marks) and **FOUR** other questions (50 marks each)

**Marks may be lost if all your work is not clearly shown or if you do not indicate where a calculator has been used.**

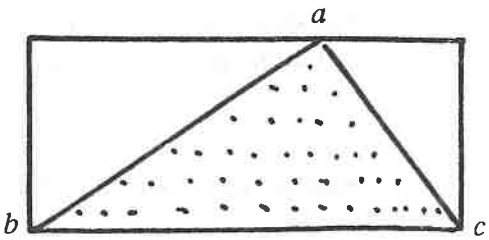
**1.** **(i)** Say which is the greater length

(167 m 67 cm) or (16776 cm)

**(ii)** A bank gives 58p for every US dollar. How much in IR£ would a bank give for 400 US dollars ?

**(iii)** Divide IR£96 into three parts in the ratio 1 : 2 : 3.

**(iv)** A piece of land in the form of a rectangle measures 29m by 13m. The triangular piece *abc* grows shrubs while the remainder grows grass.
Find the area that is under grass.

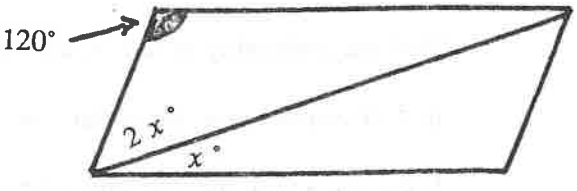



**(v)** If $\sin (A + 30)^\circ = 0{\cdot}6060$, find A.

**(vi)** Let $\cos A = p$ and $\cos B = q$.
If $p < q$, give an example to show that $A > B$.

**(vii)** "In an isosceles triangle the measures of the angles at the base are in the ratio 1:1".
Is this statement true ? Give a reason.

**(viii)** The diagram shows a parallelogram.
Calculate $x$.

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(ix) Calculate the distance between the two points (7, 0), (2, 12).

$$\left[\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}\right]$$

(x) Find the slope of the line joining the two points (7, 0), (2, 12).

$$\left[\frac{y_2 - y_1}{x_2 - x_1}\right]$$

2. Taking $\pi = \frac{22}{7}$ the area of a circle is 154 $cm^2$

A piece of string has the same length as the length of the circle.

Investigate if this piece of string will also go around a square of area 144 $cm^2$.

If the string is too long, calculate by how much it is too long.

If the string is too short, calculate by how much it is too short.

3. A rectangular slab of plastic has length 32 cm, width 12·5 cm and height 25 cm. Calculate its volume.

The slab is melted down and reformed into 10 solid cylinders each of height 2·8 cm and in the process 12% of the plastic is wasted.

Find the radius length of the base of each cylinder. Take $\pi = \frac{22}{7}$

4. (a) What is the probability that in a single throw of a fair die the number thrown is a 3 or a 4 ?

(b) A die is loaded. The probabilities of 1, 2, 3 etc. being thrown are given in the table.

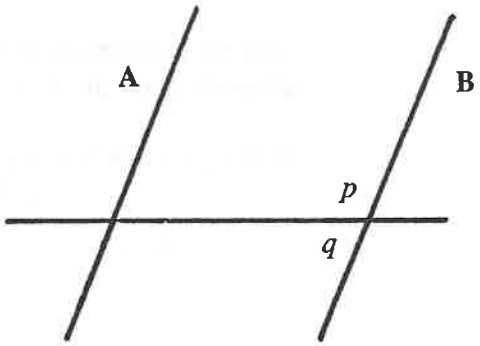
| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | 0.15 | 0.14 | 0.14 | 0.15 | 0.16 | |

Find the probability of a 6 being thrown.

In 1200 throws how many times would you expect a 6 to be thrown ?

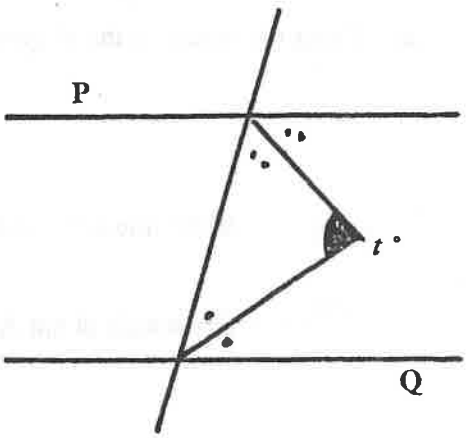
If the die was a fair one, how many times would you expect the 6 to be thrown in 1200 throws ?

**5.** (i) What is meant by saying that two lines A and B are parallel ?




(ii) In the diagram A ∥ B
and $p$, $q$ are the measures of the angles shown.
If $p = (x + y)^\circ$ and $q = (x - y)^\circ$, find $x$.

If also $p = 2q$, find $y$.



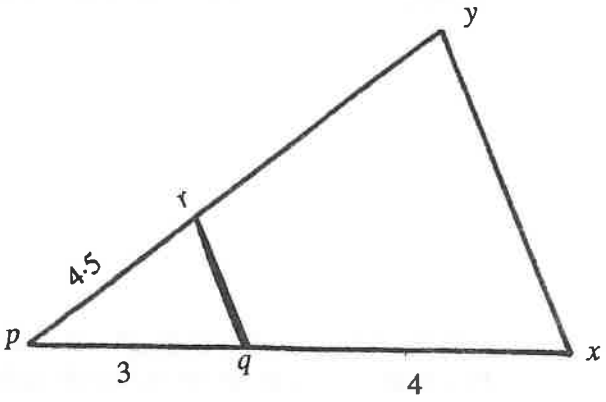

(iii) In the diagram P ∥ Q.
The dots indicate the bisected angles.
Calculate $t$, the measure of the shaded angle.

**6.** (a) $abcd$ is a parallelogram having area 65 $m^2$.

If $|bc| = 10$ cm, calculate the height of the parallelogram where $[bc]$, the base, is horizontal.

Construct the parallelogram given that $|\angle dab| = 60^\circ$, showing all construction lines clearly.

(b) The $\Delta\ pxy$ is an enlargement of the $\Delta\ pqr$ where the centre of the enlargement is $p$.




Calculate

(i) the scale factor of the enlargement giving your answer as a percentage to the nearest integer.

(ii) $|ry|$

(iii) $|qr| : |xy|$

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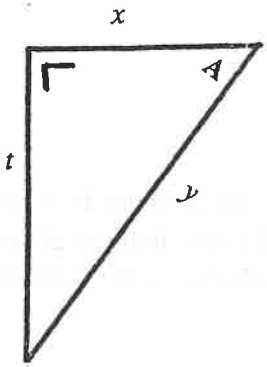
**7.** $p$ and $q$ are two points having coordinates $(5, -2)$ and $(-5, 4)$, respectively.

Find the coordinates of the midpoint of $[pq]$ and say, giving your reason, if the midpoint is on the Y axis.

Find the equation of the line through this midpoint which is perpendicular to $pq$.

$$\left[\ y - y_1 = m(x - x_1)\ \right]$$

**8.** **(a)** Using the letters in the diagram



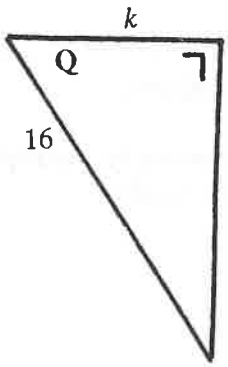

**(i)** Write down the ratio for tan A.

**(ii)** Say which of sin A, cos A, tan A is $\frac{t}{y}$

**(b)** Given that

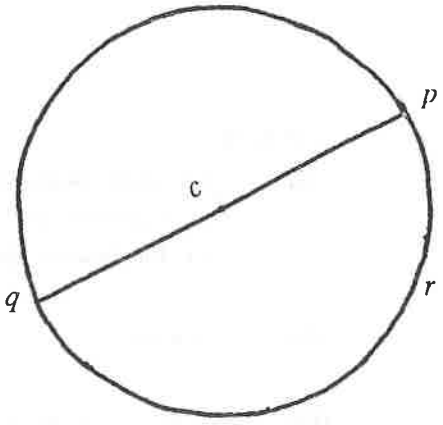
$$\cos Q = 0{\cdot}8$$

calculate $k$ and find the area of the triangle.




**(c)** $c$ is the centre of the circle of radius length 10 cm and $r$ is a point on the circle such that

$$|qr| : |rp| = 4 : 3.$$




Calculate $|qr|$ and $|\angle pqr|$ as accurately as the Tables allow.