

FOR THE EXAMINER

EXAM. NUMBER:

Total
Marks:


Coimisiún na Scrúduithe Stáit State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2011

MATHEMATICS – ORDINARY LEVEL – PAPER 2 (300 marks)

MONDAY, 13 JUNE – MORNING, 9.30 to 11.30

Time: 2 hours

Attempt **ALL** questions. Each question carries 50 marks.

Answers and supporting work should be written into the boxes provided.

Extra paper and graph paper can be obtained from the Superintendent, if needed.

The symbol indicates that supporting work must be shown to obtain full marks.


Make and model of calculator used:

For Superintendent/Examiner use only:

Centre Stamp

Question	Mark	Adv. Exam.
1		
2		
3		
4		
5		
6		
Total		
Grade		

1. (a) Multiply 320 grams by 5 and give your answer in kilograms.



- (b) John travelled by car from Tralee to Galway.
He left Tralee at 09:45 and arrived in Galway at 12:57.

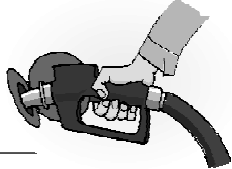

- (i) How long did it take John to travel from Tralee to Galway?
Give your answer in hours and minutes.



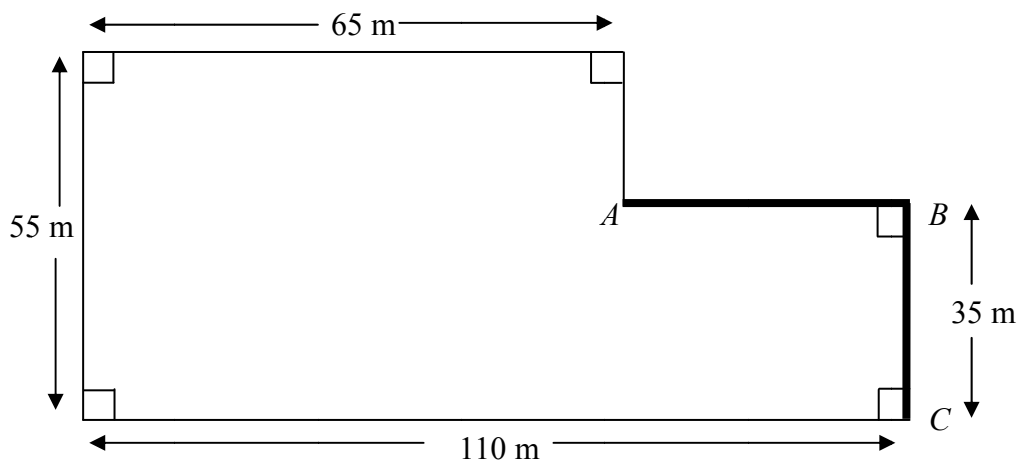
- (ii) The distance from Tralee to Galway is 200 km.
Calculate John's average speed, in km/h.



- (iii) John had estimated it cost 22 cent per km to drive his car.
How much did it cost him to drive his car from Tralee to Galway?




(c) The shape and measurements of a field are shown in the diagram below.



(i) Find the length $|AB|$.

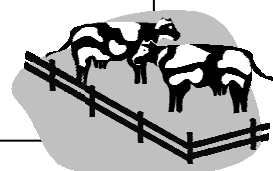


(ii) Find the length of the perimeter of the field.



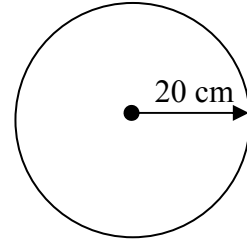
(iii) The sections $[AB]$ and $[BC]$ are stone walls.
 A farmer wishes to put fencing around the rest of the field.
 The fencing costs €62.50 per 5 metres.
 Find the cost of the fencing.






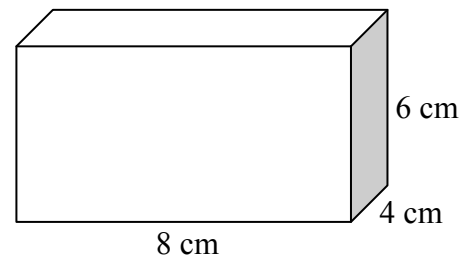
2. (a) A circular disc has a radius of 20 cm.

Taking π as 3.142 find, in cm^2 , the area of the disc.





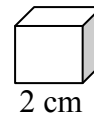
(b) A solid rectangular block of wood has length 8 cm, width 4 cm and height 6 cm.




(i) Find, in cm^3 , the volume of the block of wood.



(ii) Find, in cm^3 , the volume of a cube of side 2 cm.

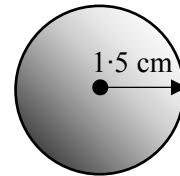




(iii) How many solid cubes, each of side 2 cm, can be made from the block of wood in (i)?



- (c) A solid metal sphere has radius length 1.5 cm.



- (i) Taking π as 3.142 find, in cm^3 , the volume of the sphere.
Give your answer correct to two decimal places.




- (ii) 100 of these spheres were melted down and recast as a cylinder.
The cylinder had a diameter of 10 cm.
Find, to the nearest cm, the height of the cylinder.

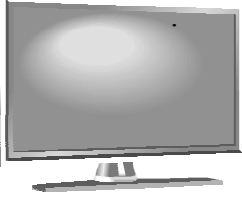


3. (a) Find the mean of the numbers:

4.1, 5.9, 10.2, 7.3, 13.5

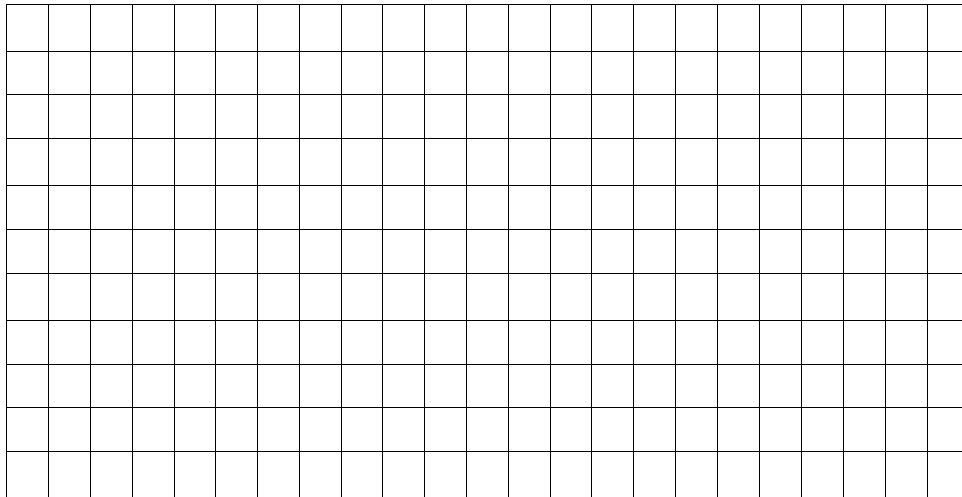
 Mean =

(b) The table shows the number of hours Mary spent watching television from Monday to Friday during a mid-term break.




Day of the week	Monday	Tuesday	Wednesday	Thursday	Friday
Number of hours	5	4	4	2	1

(i) Draw a bar chart of the data.



(ii) On which day of the week did Mary spend most time watching television?

(iii) Write the number of hours Mary spent watching television on Thursday as a fraction of the total number of hours she spent watching television from Monday to Friday.




- (c) The number of days that each of 20 pupils was absent from school during a six week period is listed below:

1	2	0	1	2
0	4	4	5	1
2	1	2	1	0
4	0	5	3	1

- (i) Complete the following frequency table.

Number of days absent	0	1	2	3	4	5
Number of pupils						

- (ii) Calculate the mean number of days absent per pupil.
Give your answer correct to the nearest number of days.



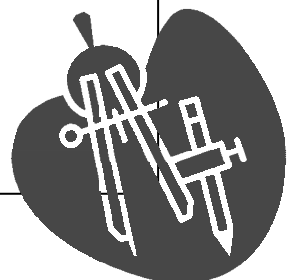
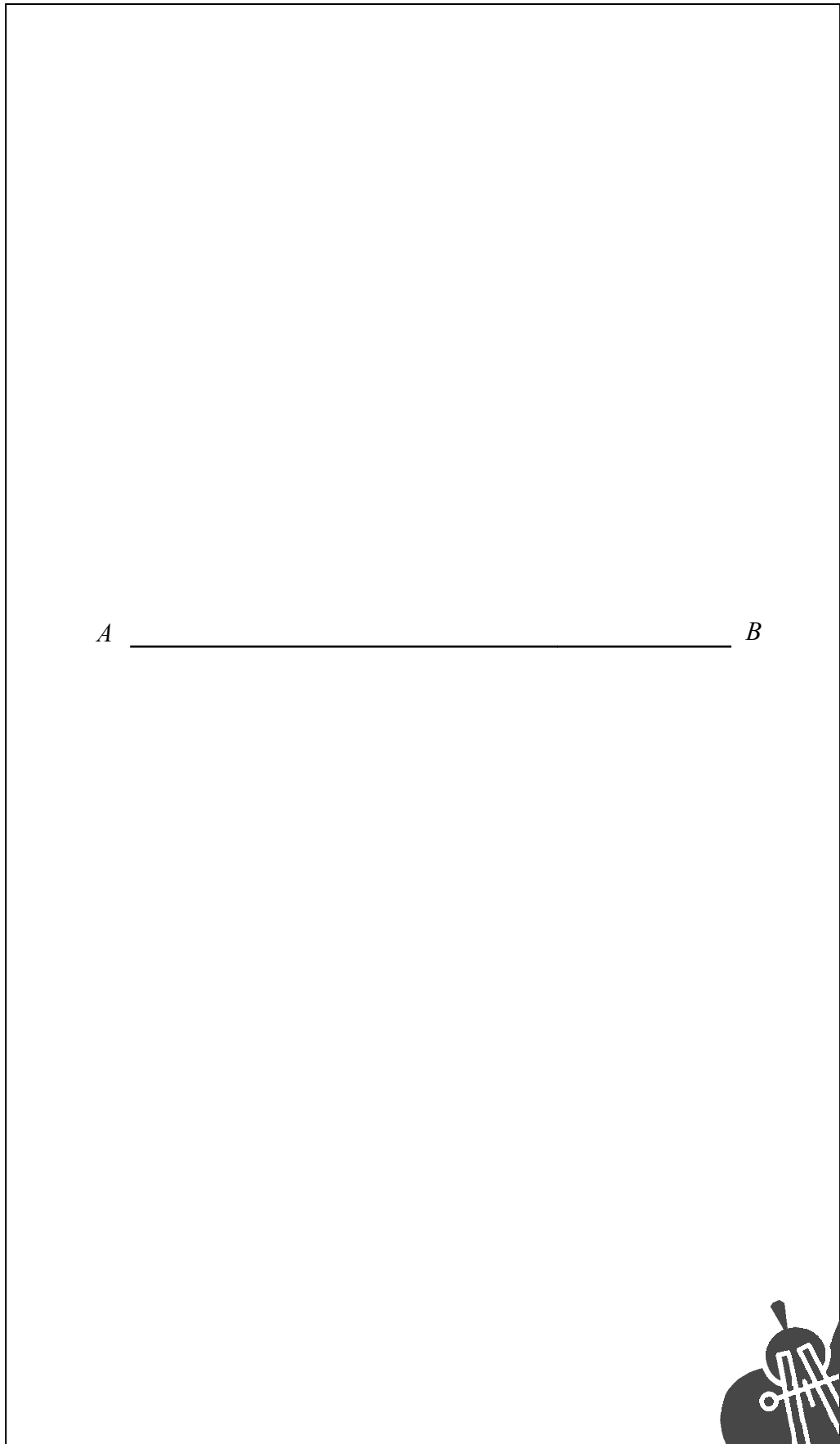
A large rectangular box for writing the answer to question (ii).

- (iii) What percentage of the pupils was absent for 3 days or more?

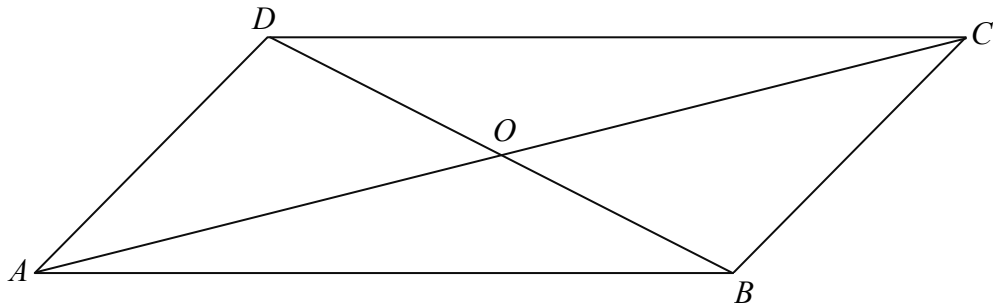


A large rectangular box for writing the answer to question (iii).

4. (a) Using only a compass and straight edge, construct the perpendicular bisector of $[AB]$.
Show all construction work.



- (b) $ABCD$ is a parallelogram.
The diagonals $[AC]$ and $[BD]$ intersect at the point O .



- (i) Find the image of $[AD]$ by the translation \overrightarrow{DC} .

- (ii) Name the angle equal in measure to $\angle DAO$.

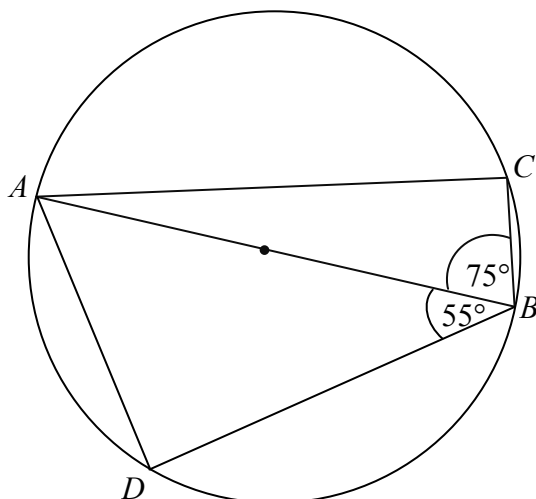
- (iii) Complete the following reasons for the fact that the triangles $\triangle AOD$ and $\triangle BOC$ are congruent.

Reasons:	In $\triangle AOD$		In $\triangle BOC$
		=	
		=	
		=	

Part (c) is on the next page.

(c) $[AB]$ is a diameter of a circle.

C is a point on the circle and $|\angle ABC| = 75^\circ$.



(i) Write down $|\angle ACB|$ and give a reason for your answer.

$|\angle ACB| =$

Reason:

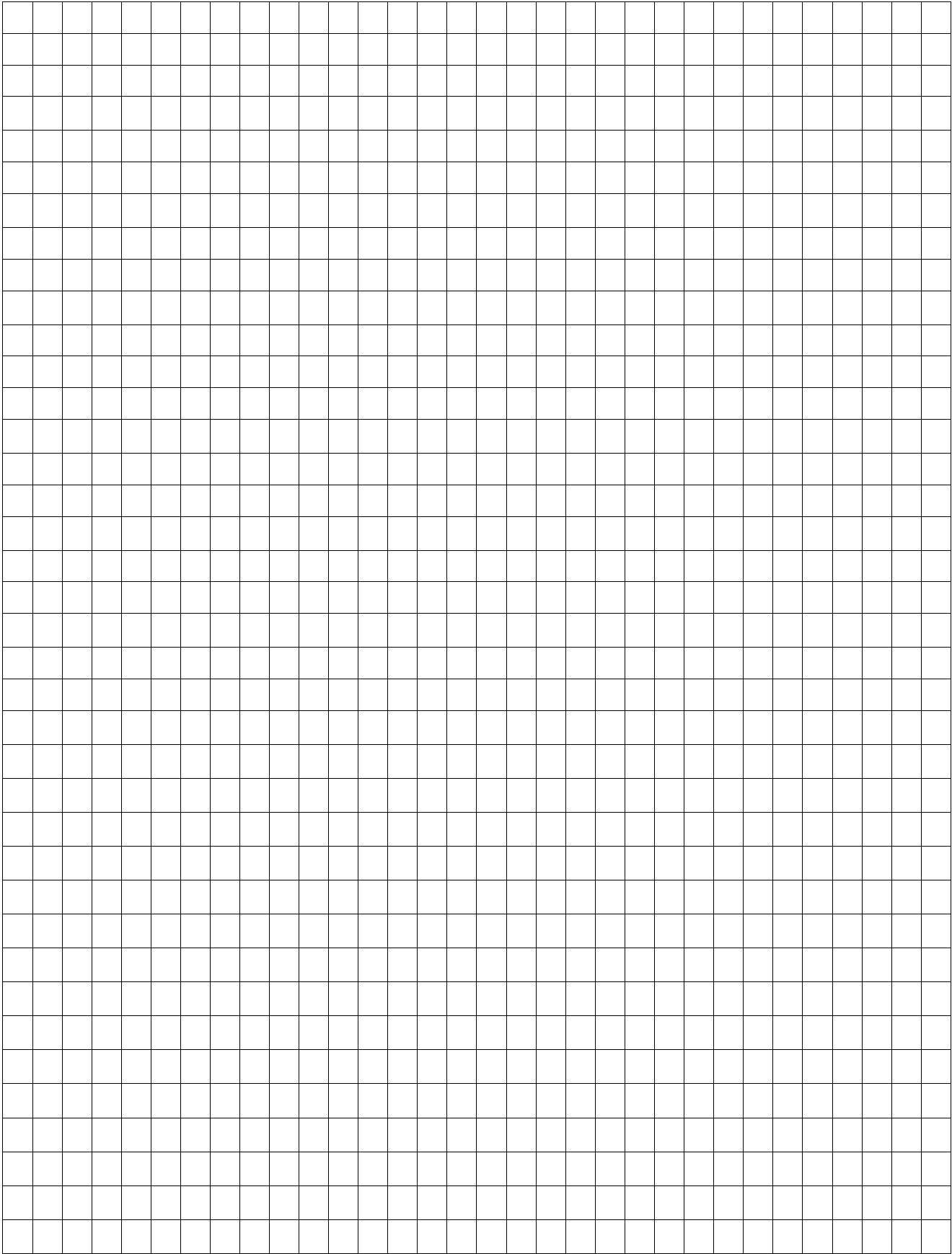
(ii) Calculate $|\angle BAC|$.



D is another point on the circle and $|\angle ABD| = 55^\circ$.


(iii) Find $|\angle DAC|$.





- (c) (i) l is the line $3x + 2y - 12 = 0$.

Verify that the point $(4, 0)$ is on the line l .



A large empty rectangular box for writing the solution to part (i).

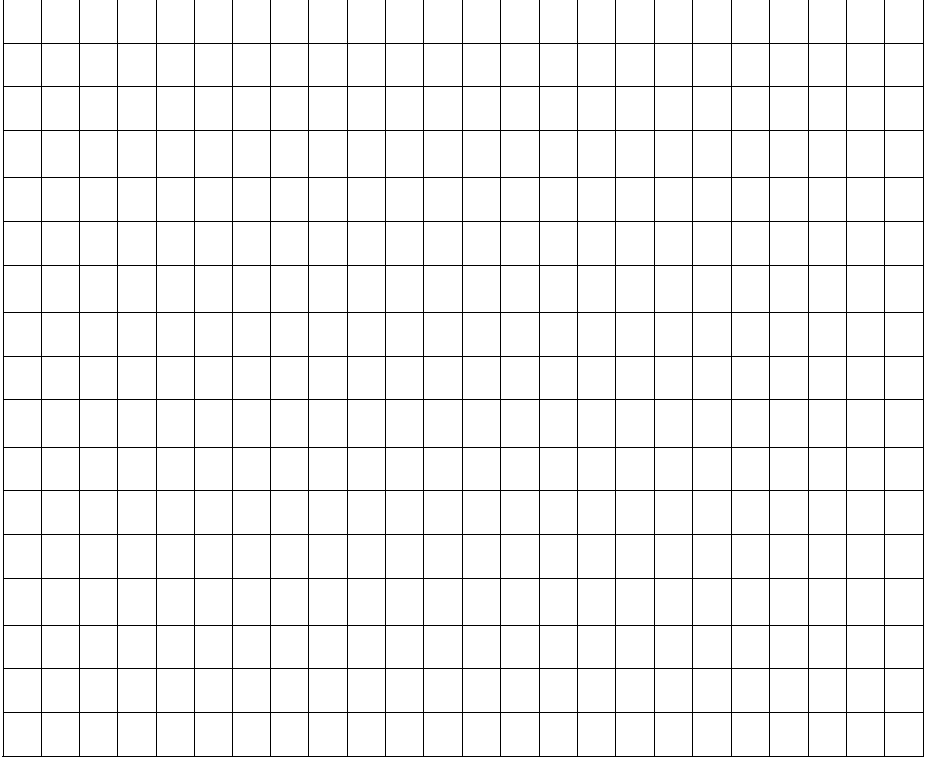

- (ii) l cuts the y -axis at the point T .

By letting $x = 0$ find the co-ordinates of the point T .



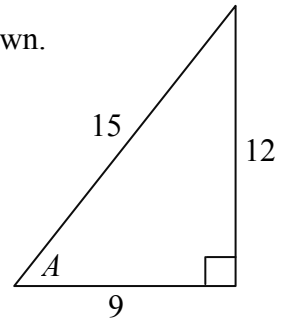
A large empty rectangular box for writing the solution to part (ii).

- (iii) Hence draw the line l on the grid below.



A large rectangular box containing a grid for drawing the line l . The grid is 20 units wide and 20 units high. A small icon of a hand writing is in the top-left corner of the grid area.

6. (a) The right-angled triangle in the diagram has measurements as shown.



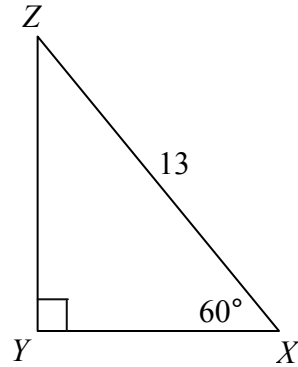
- (i) Write down the length of the side opposite the angle A .

Length of the side opposite the angle $A =$

- (ii) Write down, as a fraction, the value of $\sin A$.

$\sin A =$

- (b) In the right-angled triangle XYZ ,
 $|XZ| = 13$ and $|\angle YXZ| = 60^\circ$.



- (i) Using your calculator, write down the value of $\cos 60^\circ$.

$\cos 60^\circ =$

- (ii) Using the diagram, complete the following

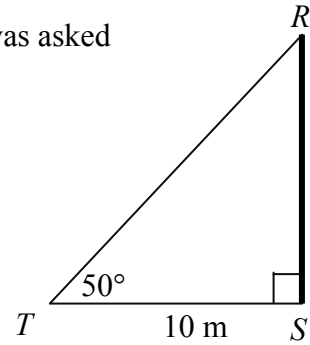
$$\cos 60^\circ = \frac{|XY|}{\square}$$

- (iii) Hence calculate $|XY|$.



- (c) As part of an activity lesson a group of students was asked to measure the height of the mast $[RS]$.

The mast, $[RS]$, is supported by the cable $[RT]$.



The students measured the distance from S to T and they also measured the angle $\angle STR$.

They found $|ST| = 10$ m and $|\angle STR| = 50^\circ$.

- (i) Find the height of the mast $|RS|$.

Give your answer correct to the nearest metre.

- (ii) Using the theorem of Pythagoras, or otherwise, find the length of the supporting cable, $|RT|$.

Give your answer correct to the nearest metre.

Space for extra work

