FOR THE EXAMINER

EXAM. NUMBER:

Total
Marks:

Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2012

MATHEMATICS – ORDINARY LEVEL – PAPER 2 (300 marks)

MONDAY, 11 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		

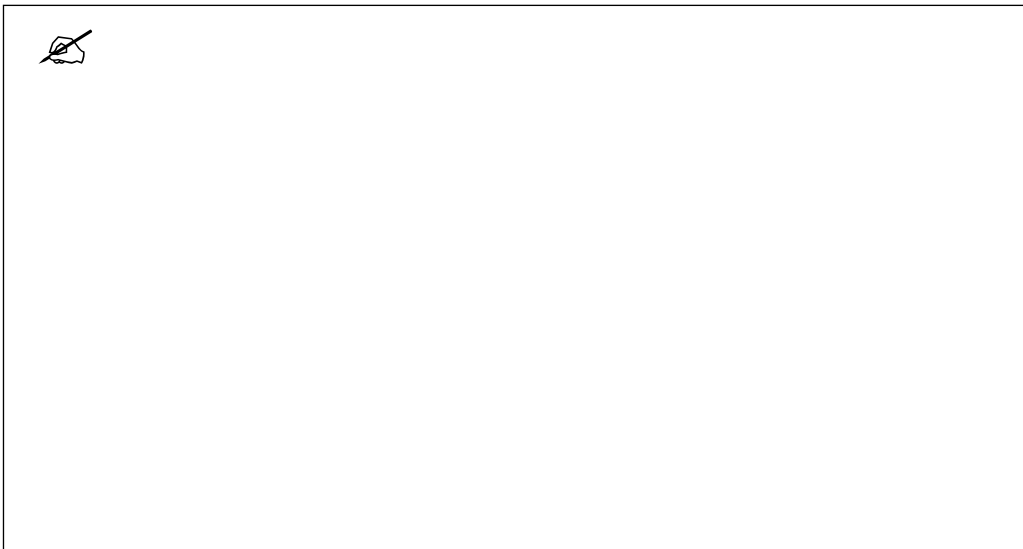**1.** **(a)** Add 250 grams to 950 grams and give your answer in kilograms.

(b) **(i)** Áine started a car journey in Dublin at 10:20 and arrived in Rosslare at 12:50.

How long did it take Áine to reach Rosslare?
Give your answer in hours and minutes.

(ii) The distance from Dublin to Rosslare is 150 km.

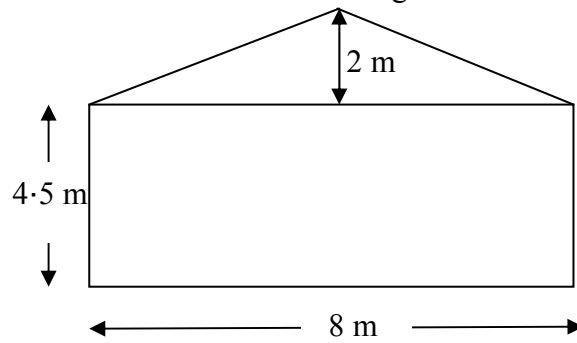What was her average speed for the journey? Give your answer in km/h.

(iii) On the return journey from Rosslare to Dublin Áine's average speed was 75 km/h.

How long did the return journey take?

(c) The end wall of a house consists of a lower rectangular section and a top triangular section.
The measurements are shown in the diagram.

2 m

4·5 m

8 m

(i) Find, in m², the area of the lower rectangular section.

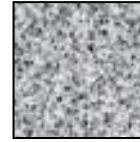**(ii)** Find, in m², the area of the top triangular section.

(iii) Dara intends to paint the wall.
He finds out that 5 litres of paint will cover 32 m².

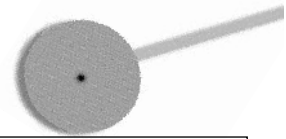How many litres of paint will he need to cover the wall with two coats of paint?

2. **(a)** The length of the side of a square tile is 15 cm.

Find, in cm², the area of 6 of these tiles.

15 cm

(b) A trundle wheel has a diameter of 20 cm.

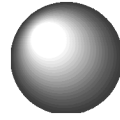**(i)** Find, in cm, the radius of the wheel.

(ii) Taking π as 3·142 calculate, in cm, the circumference of the trundle wheel.

(iii) Máire used the trundle wheel to measure the length of a school corridor.
The trundle wheel made 24 complete turns.

What was the length of the corridor?
Give your answer in metres, correct to the nearest metre.

(c) A sphere has a radius of 2·4 cm.

(i) Taking π as 3·142 find, in cm^3, the volume of the sphere.
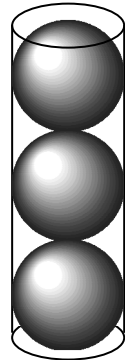Give your answer correct to the nearest whole number.

(ii) Three of these spheres fit exactly into a cylindrical container.

Find, in cm^3, the volume of the container.
Take π as 3·142.
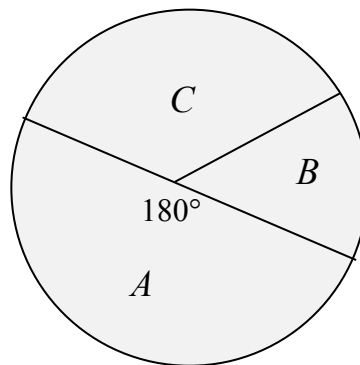Give your answer correct to one decimal place.

3. **(a)** Find the mode of the following numbers:

$$2, \quad 3, \quad 5, \quad 7, \quad 3, \quad 7, \quad 2, \quad 9, \quad 7.$$

(b) A group of teenagers was asked which of A, B, or C was their favourite sport. The results are shown in the pie chart below.

(i) 24 of the teenagers said A was their favourite.

How many were in the group?

(ii) 18 gave C as their favourite.

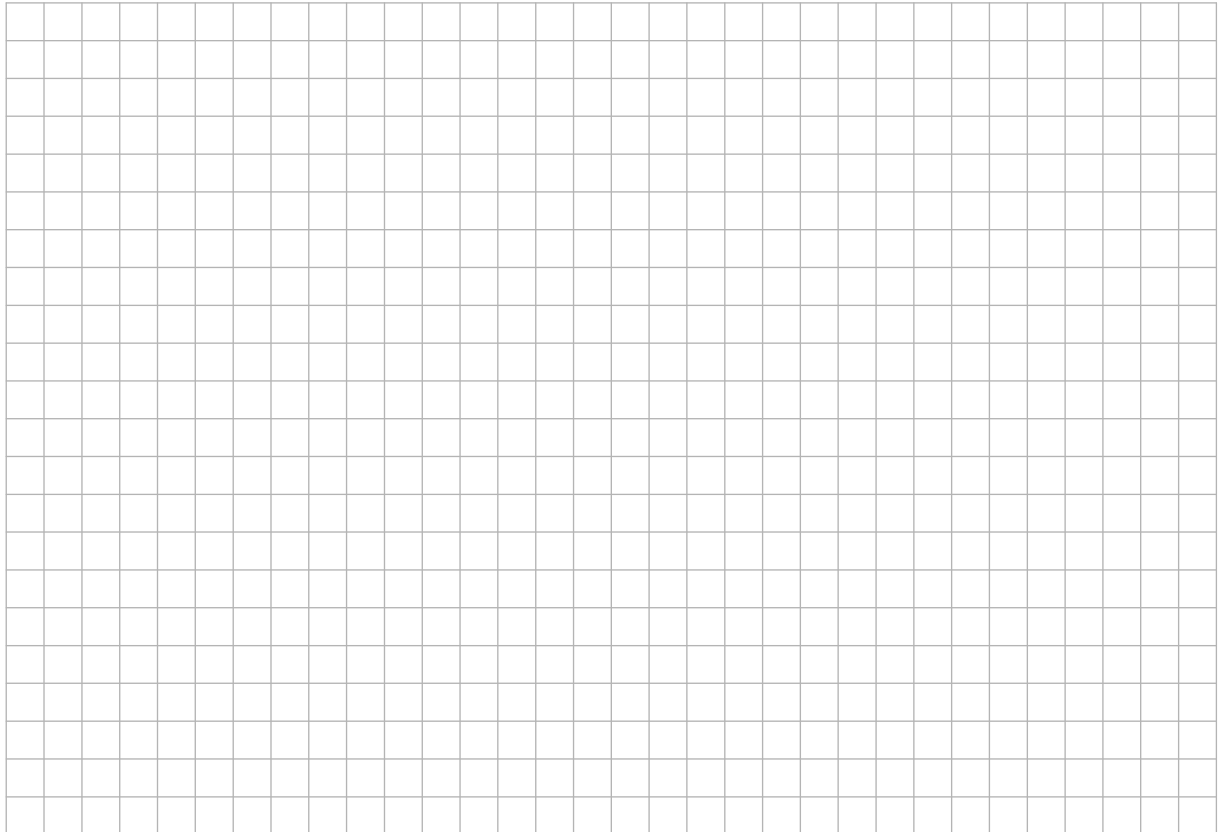What is the measure of the angle in the sector C?

(iii) What percentage of the total gave B as their favourite?

(c) The number of newspapers sold in a shop from Monday to Saturday of one week is given in the table below:

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Number of papers	35	30	10	30	35	40

(i) Draw a bar chart of the data. Put the days on the horizontal axis.

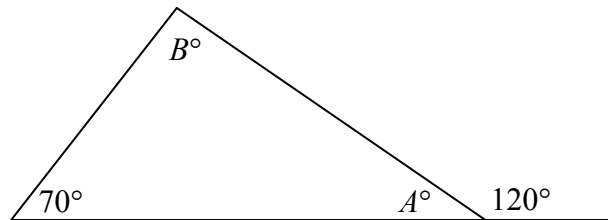**(ii)** Find the mean number of newspapers sold per day.

✍

(iii) The following week the mean was 38.
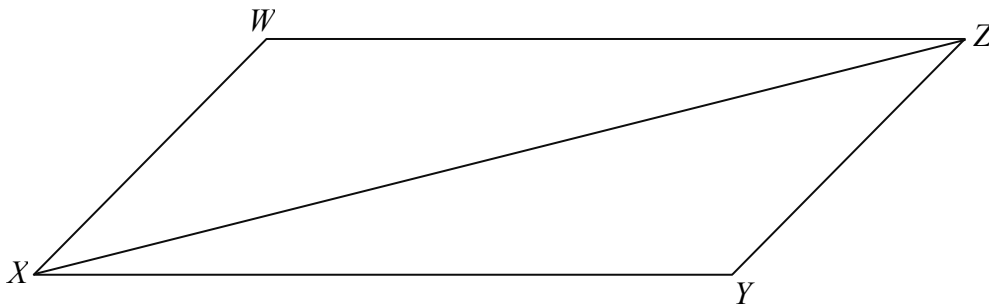
How many extra papers were sold that week?

✍

4.   **(a)**

Find the values of the angles A and B in the diagram above.
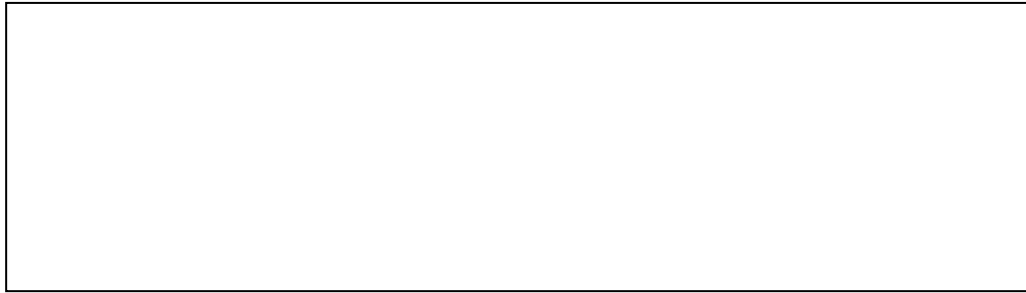
$A =$ $B =$

(b)   **(i)**   *XYZW* is a parallelogram.

Using the properties of a parallelogram:

Name another line segment equal in measure to [XW]

Answer:

Name another line segment equal in measure to [WZ]

Answer:

Name another angle equal in measure to $\angle XWZ$

Answer:

(ii)   The area of the triangle *XWZ* is 52 cm^2.
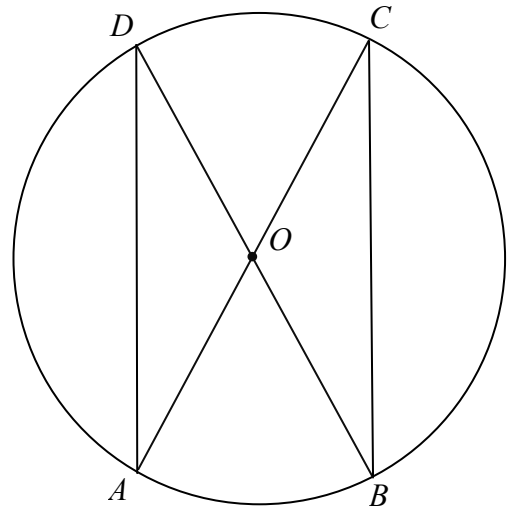
What is the area of the parallelogram *XYZW*?

(iii)   Bisect the angle $\angle PQR$ without using a protractor.
Show all construction lines.
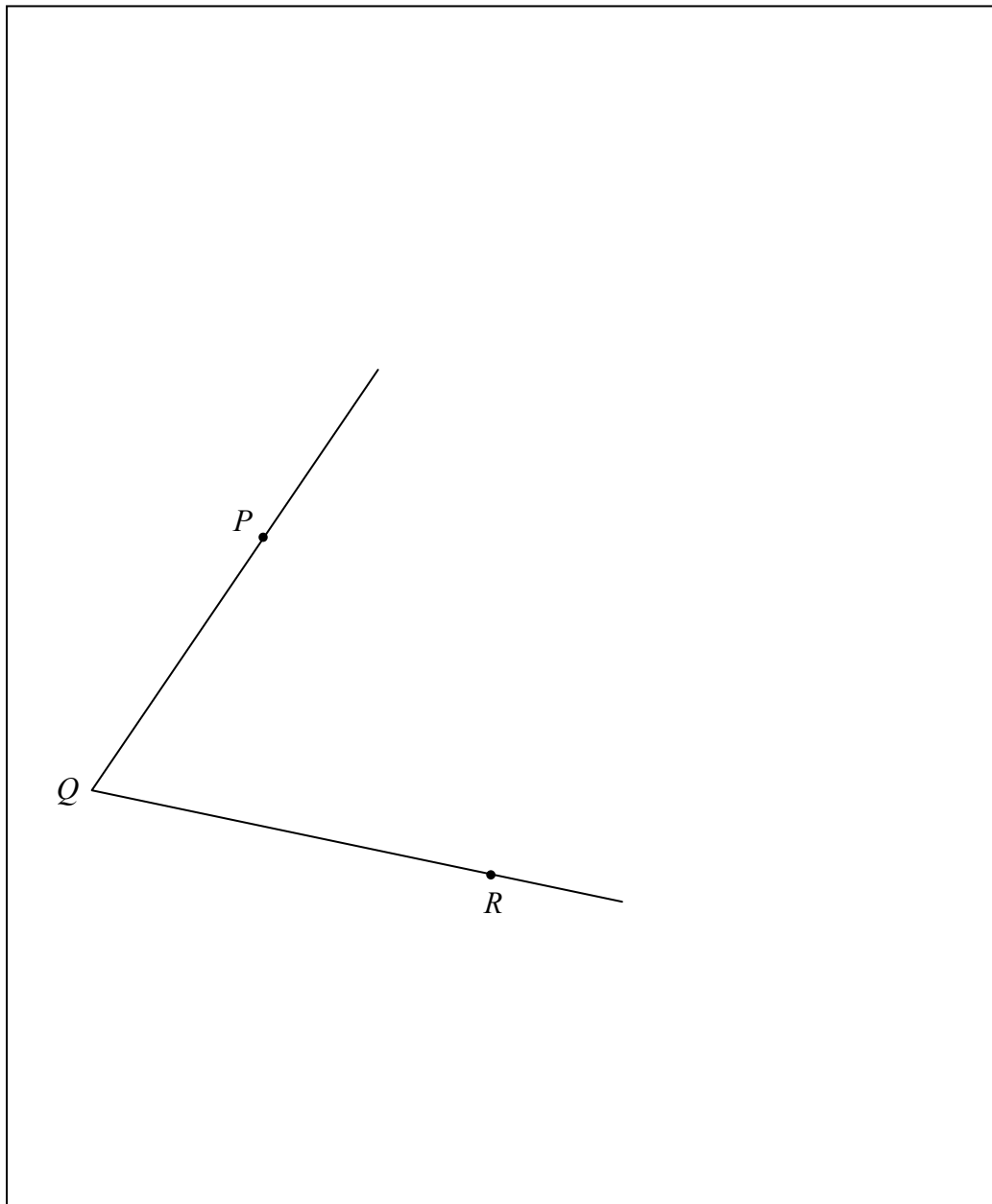
Part (c) is on the next page

(c)   *O* is the centre of the circle in the diagram.

AC and *BD* are diameters of the circle.

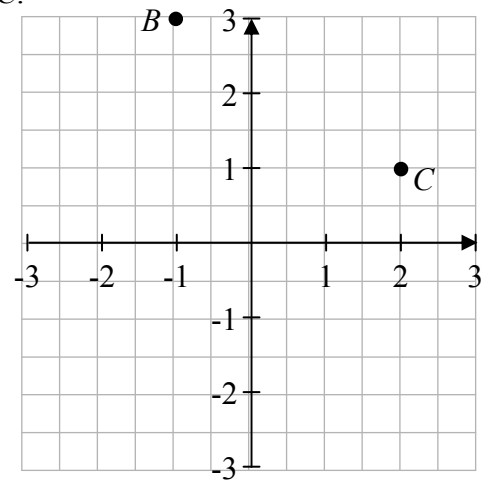**(i)**   Is the triangle *AOD* isosceles?
Explain your answer.

(ii)   What is the image of the triangle *AOD* under the central symmetry in the point *O*?

(iii)   If $|\angle OCB| = 35°$, find $|\angle COB|$.
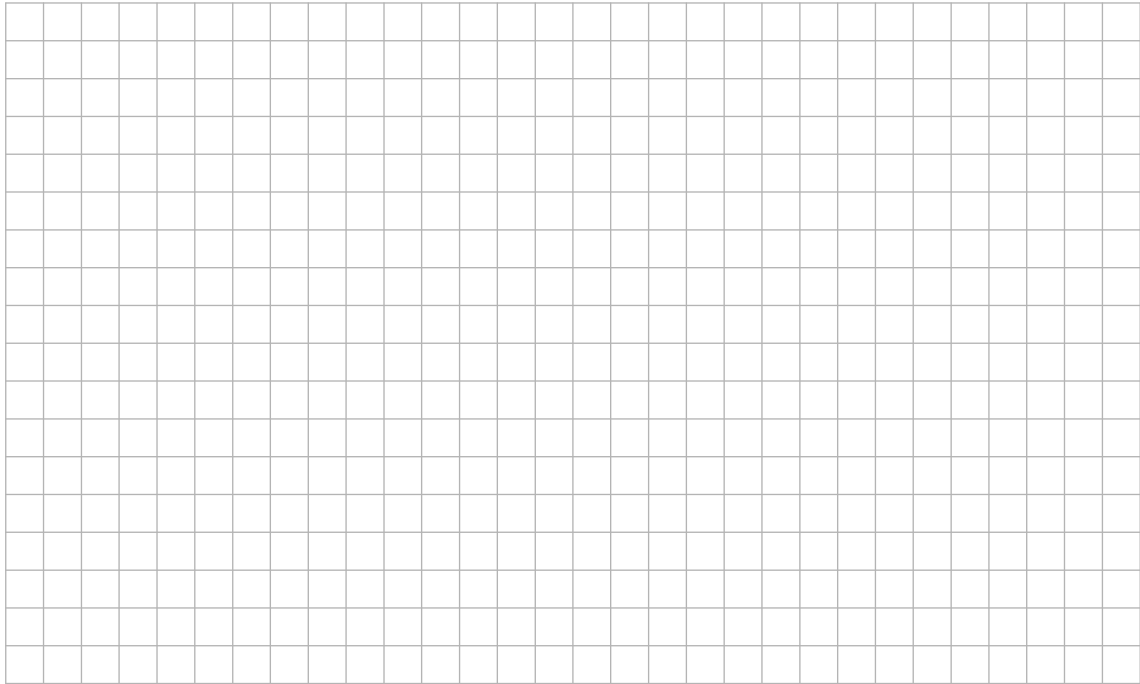
5. **(a)** Write down the coordinates of the points B and C.

$B = ($, $)$

$C = ($, $)$

(b) R is the point $(-1, 2)$ and S is the point $(5, 6)$.

Find each of the following:

(i) ✎ the midpoint of $[RS]$

(ii) ✎ the slope of RS

(iii) ✎ the length of $[RS]$

If you wish to draw a diagram, use the next page.
Part (c) is also on the next page.

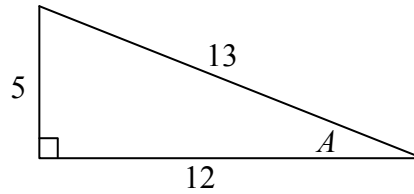**(c)**   The line *l* contains the point (2, 3). The slope of *l* is –1.

(i) Find the equation of the line *l.*

✎

(ii) By letting $y = 0$, find the co-ordinates of the point where
the line *l* meets the *x*-axis.

✎

6. **(a)** The right-angled triangle has measurements as shown.
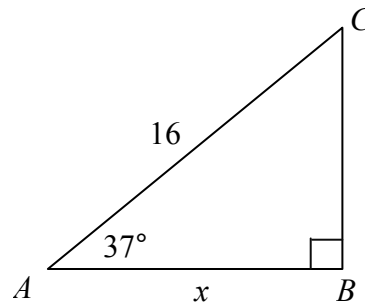

(i) Write, as a fraction, the value of sin A.

$$\sin A =$$

(ii) Write, as a fraction, the value of tan A.

$$\tan A =$$

(b) In the right-angled triangle ABC,

$|AC| = 16$, $|\angle CAB| = 37°$ and $|AB| = x$.

(i) Use your calculator to find cos 37°.
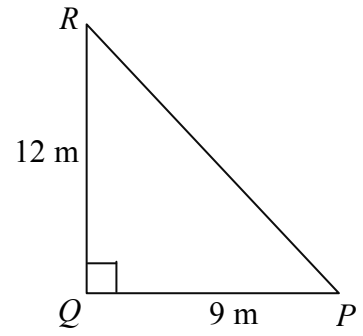Give your answer correct to one decimal place.

$$\cos 37° =$$

(ii) From the diagram write cos 37° as a fraction.

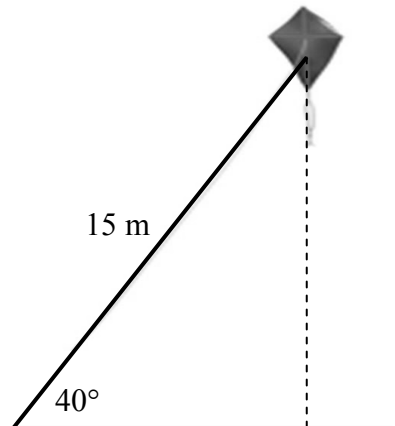$$\cos 37° = \frac{\boxed{}}{\boxed{}}$$

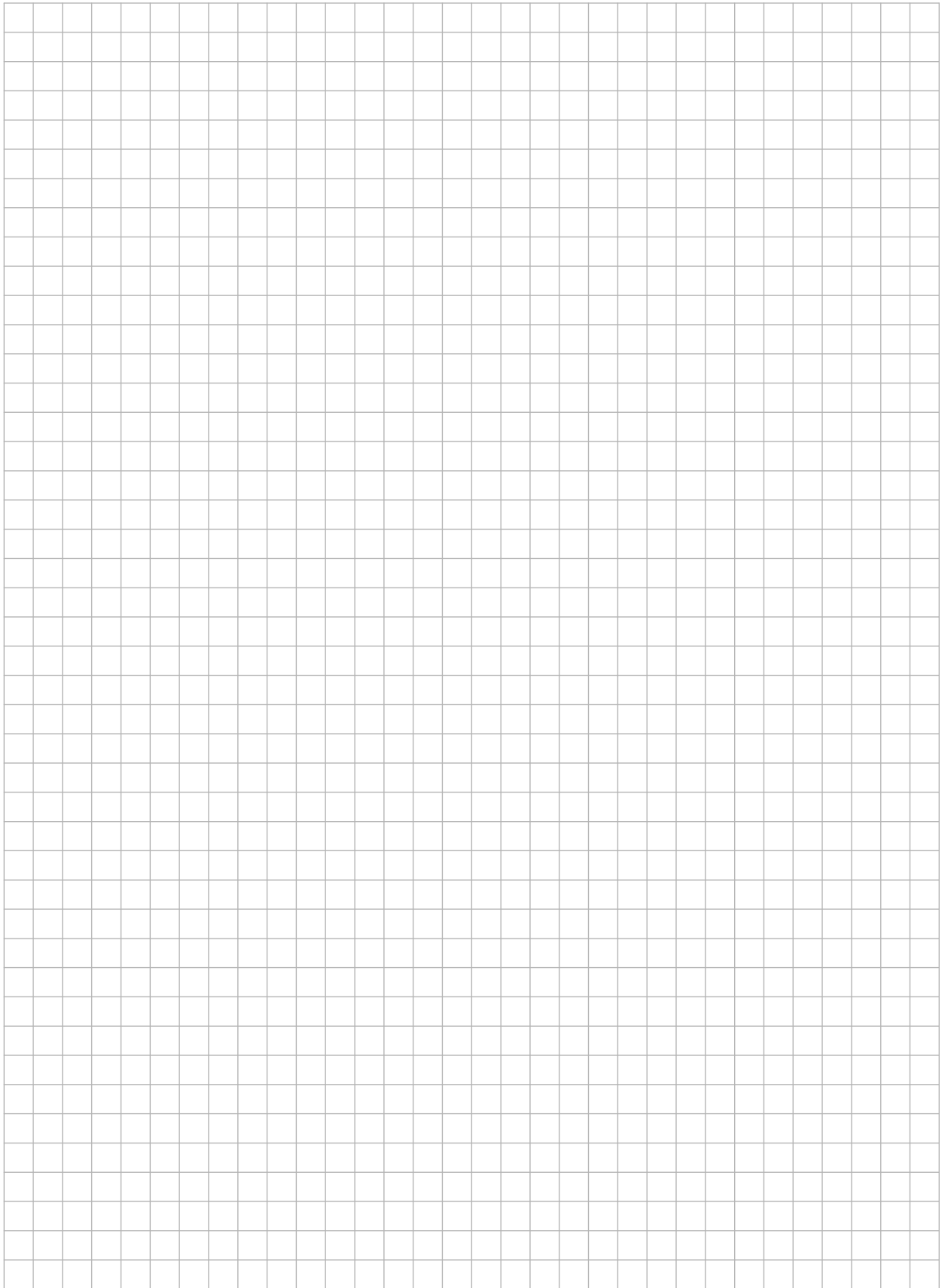**(iii)** Using the answers from parts **(i)** and **(ii)**, or otherwise, find the value of x.

(c) **(i)** In the right-angled triangle PQR

$|QR| = 12$ m, $|PQ| = 9$ m and $|\angle PQR| = 90°$.

Find $|\angle QPR|$, correct to the nearest degree.

✍

(ii) A kite on a string makes an angle of 40°
to the horizontal ground.
The length of the string is 15 m.

How high above the ground is the kite?
Give your answer to the nearest metre.

✍

Space for extra work

Space for extra work