



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2013

Mathematics (Project Maths – Phase 3)

Paper 2

Foundation Level

Monday 10 June Morning 9:30 – 12:00

300 marks

Examination number

Centre stamp

Running total	
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For examiner	
Question	Mark
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
Total	

Grade

Instructions

There are **two** sections in this examination paper.

Section A	Concepts and Skills	200 marks	8 questions
Section B	Contexts and Applications	100 marks	2 questions

Answer all ten questions, as follows:

In Section A, answer

Questions 1 to 7 and

either Question 8A **or** Question 8B.

In Section B, answer Question 9 and Question 10.

Write your answers in the spaces provided in this booklet. You may lose marks if you do not do so. There is space for extra work at the back of the booklet. You may also ask the superintendent for more paper. Label any extra work clearly with the question number and part.

The superintendent will give you a copy of the *Formulae and Tables* booklet. You must return it at the end of the examination. You are not allowed to bring your own copy into the examination.

Marks will be lost if all necessary work is not clearly shown.

Answers should include the appropriate units of measurement, where relevant.

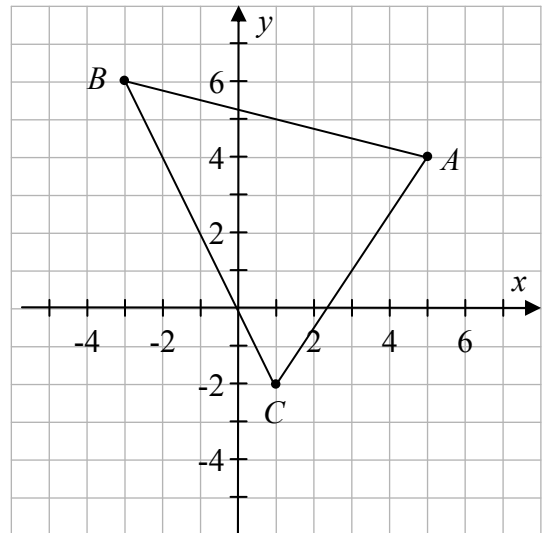
Answers should be given in simplest form, where relevant.

Write the make and model of your calculator(s) here:

Question 5

(25 marks)

The diagram shows the triangle ABC .
The co-ordinates of the point A are $(5, 4)$.



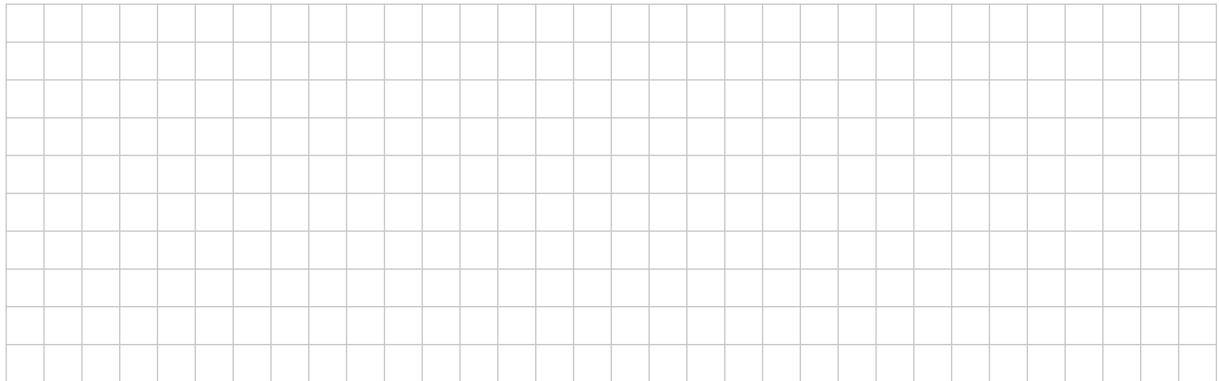
(a) Write down the co-ordinates of the points:

B (,)

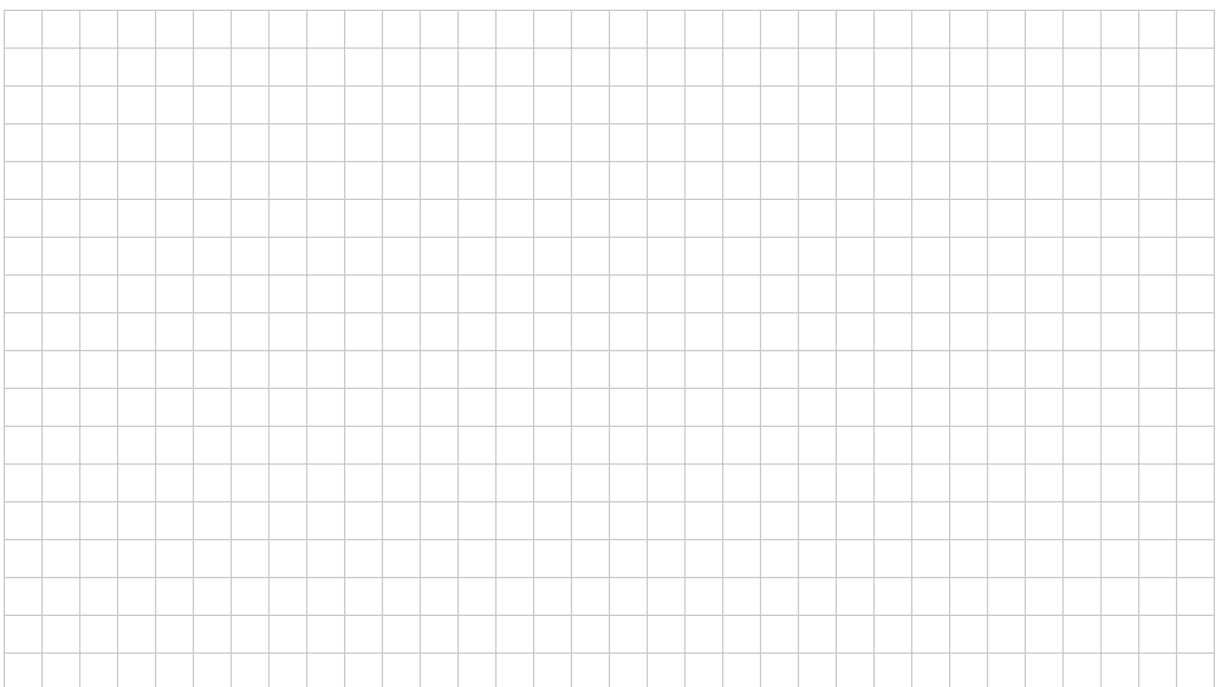
C (,)

(b) (i) On the diagram, mark the point M ,
the midpoint of $[AB]$.

(ii) Use a formula to find the co-ordinates of M .



(c) Use a formula to find the length of $[BC]$, the longest side of the triangle.



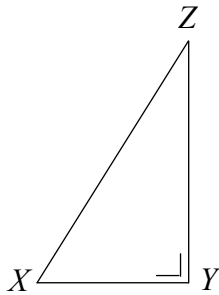
Question 7

(25 marks)

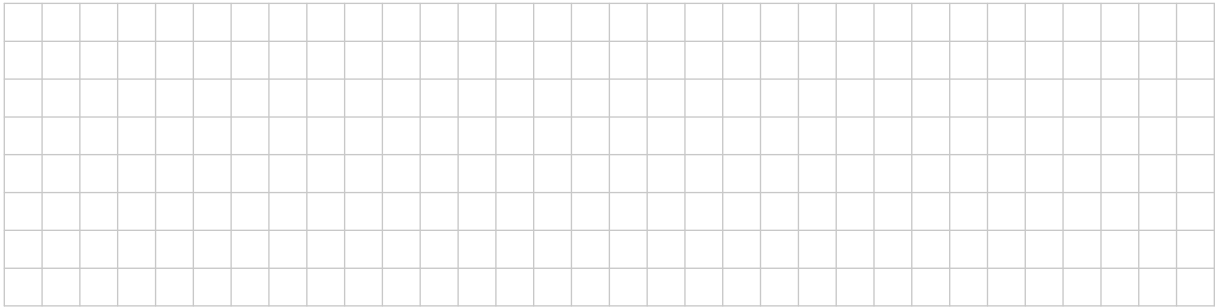
The diagram shows the point C and the right angled triangle XYZ .

- (a) Construct $X'Y'Z'$, the image of the triangle XYZ , under an enlargement of centre C and scale factor 2.5 .

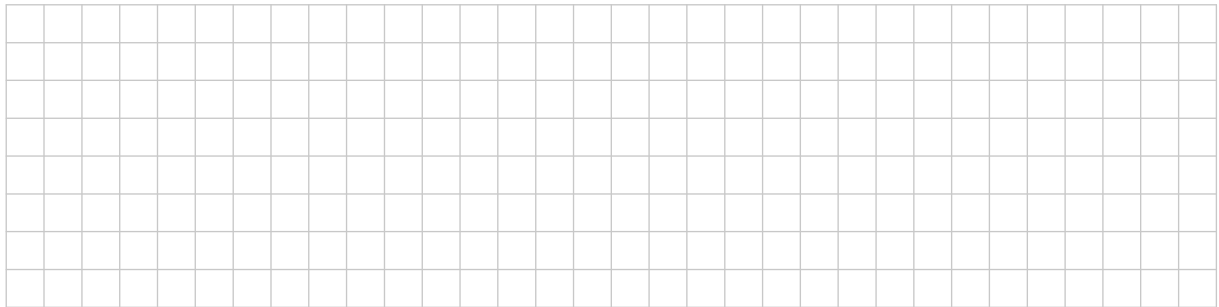
C
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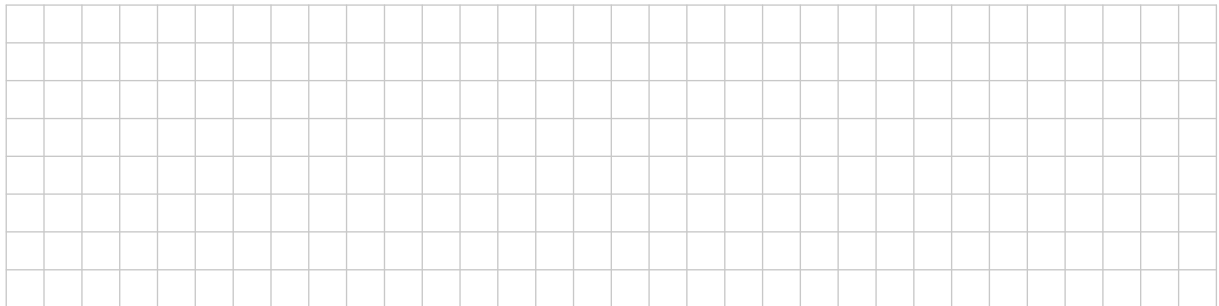
(b) (i) The length $|XY| = 2$ cm. Find the length $|X'Y'|$.



(ii) The length $|ZY'| = 8$ cm. Find the length $|ZY|$. Show your calculations below.



(iii) Find the area of the triangle XYZ .



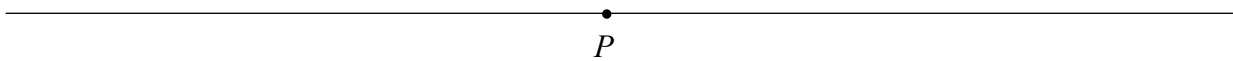
Question 8

(25 marks)

Answer **either** 8A **or** 8B.

Question 8A

- (a) Construct a triangle PQR in which $|PQ| = 7$ cm, $|QR| = 5$ cm and $|\angle PQR| = 80^\circ$.
The point P is marked for you.



- (b) On the diagram in part (a), construct the image of the triangle PQR under the central symmetry in the point P .
- (c) Use your protractor to measure the angle RPQ .

Answer: _____

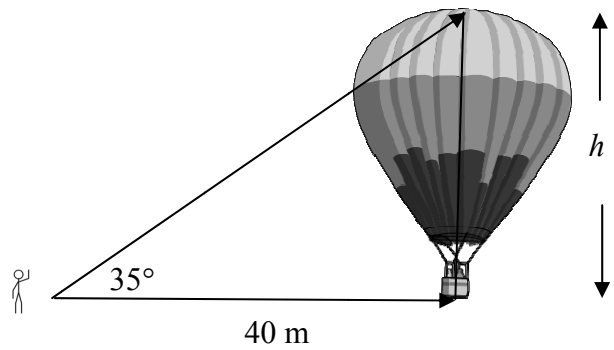
Question 10

(50 marks)

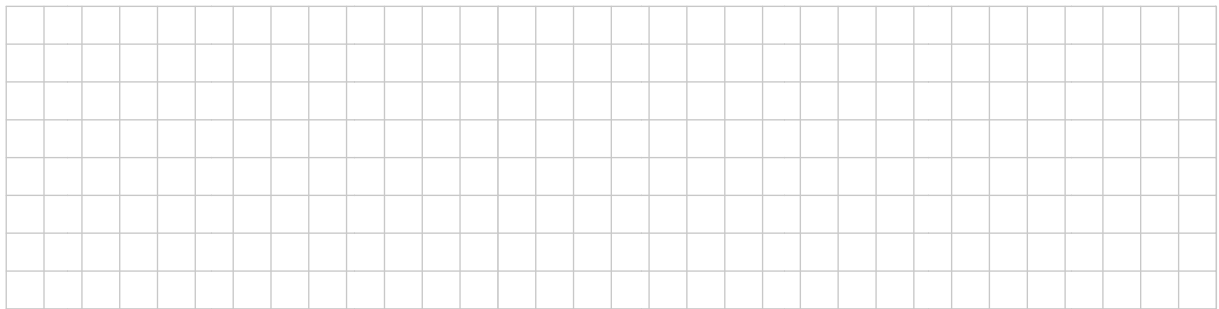
Tom stands 40 m from the base of the basket of a hot-air balloon. The angle of elevation to the top of the balloon is 35° .

- (a) (i) Find $\tan 35^\circ$.

Answer: _____

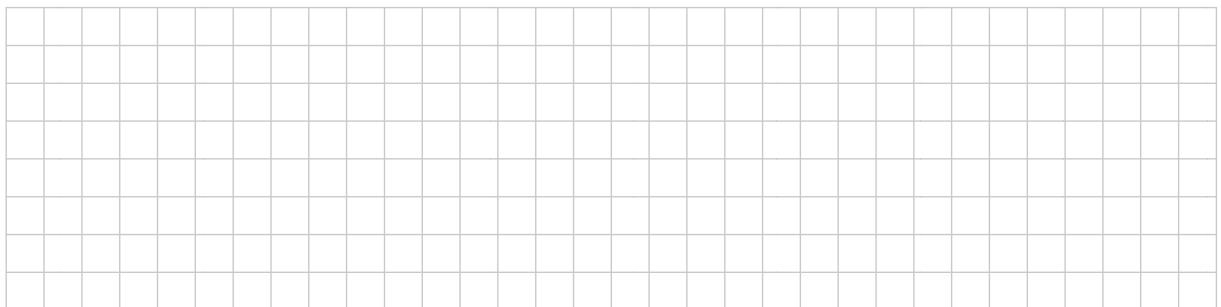
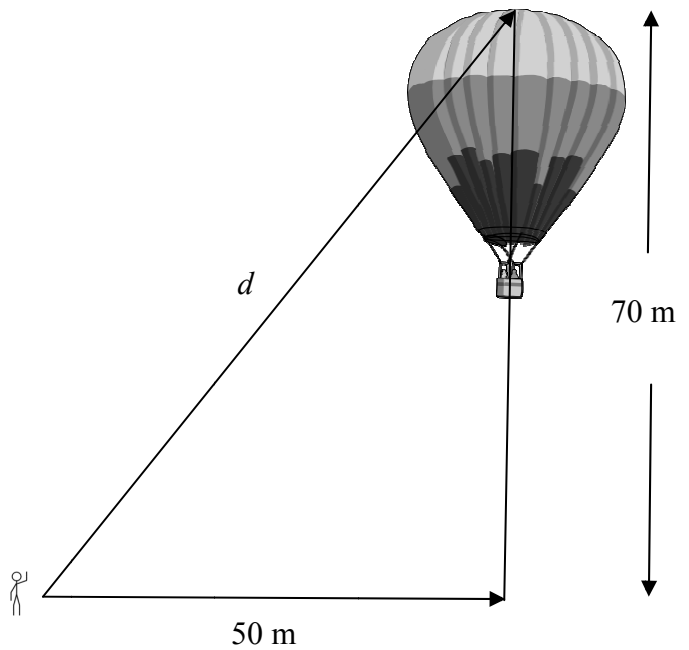


- (ii) Find the height, h , of the balloon.



- (b) The balloon rises vertically until the highest point on the balloon is 70 m above the ground. Tom moves to a new position 50 m from the point vertically under the basket of the balloon, as shown.

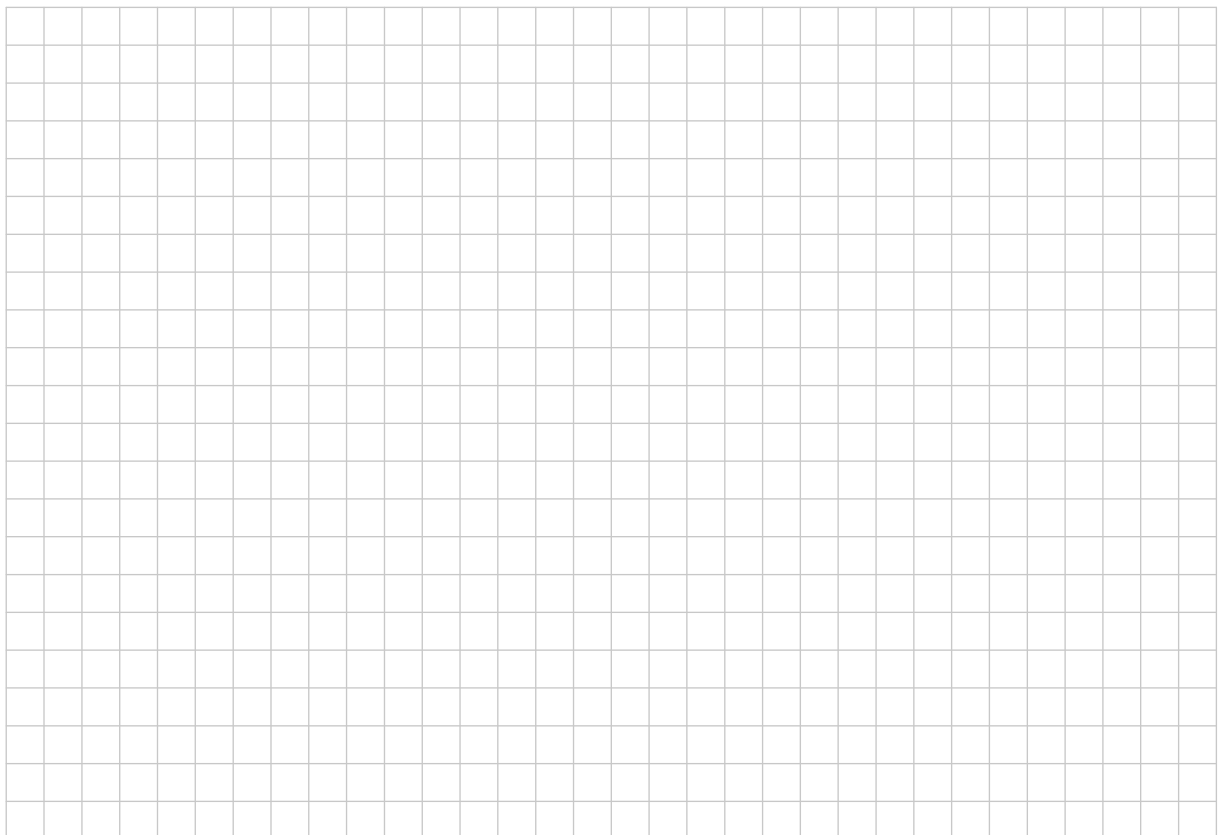
- (i) Find the new angle of elevation to the top of the balloon.



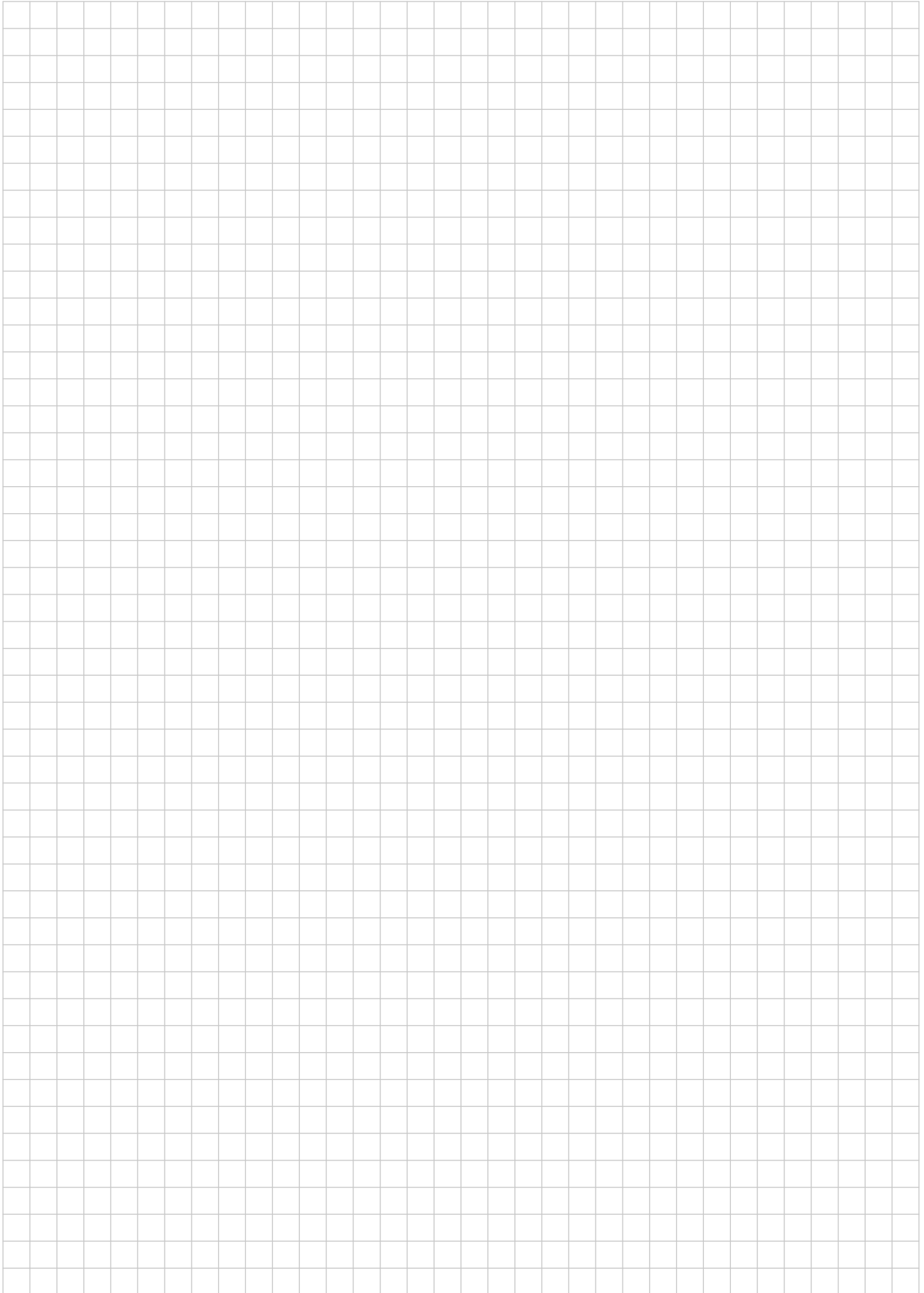
- (ii) Use the Theorem of Pythagoras to find the distance d from Tom's position to the top of the balloon.



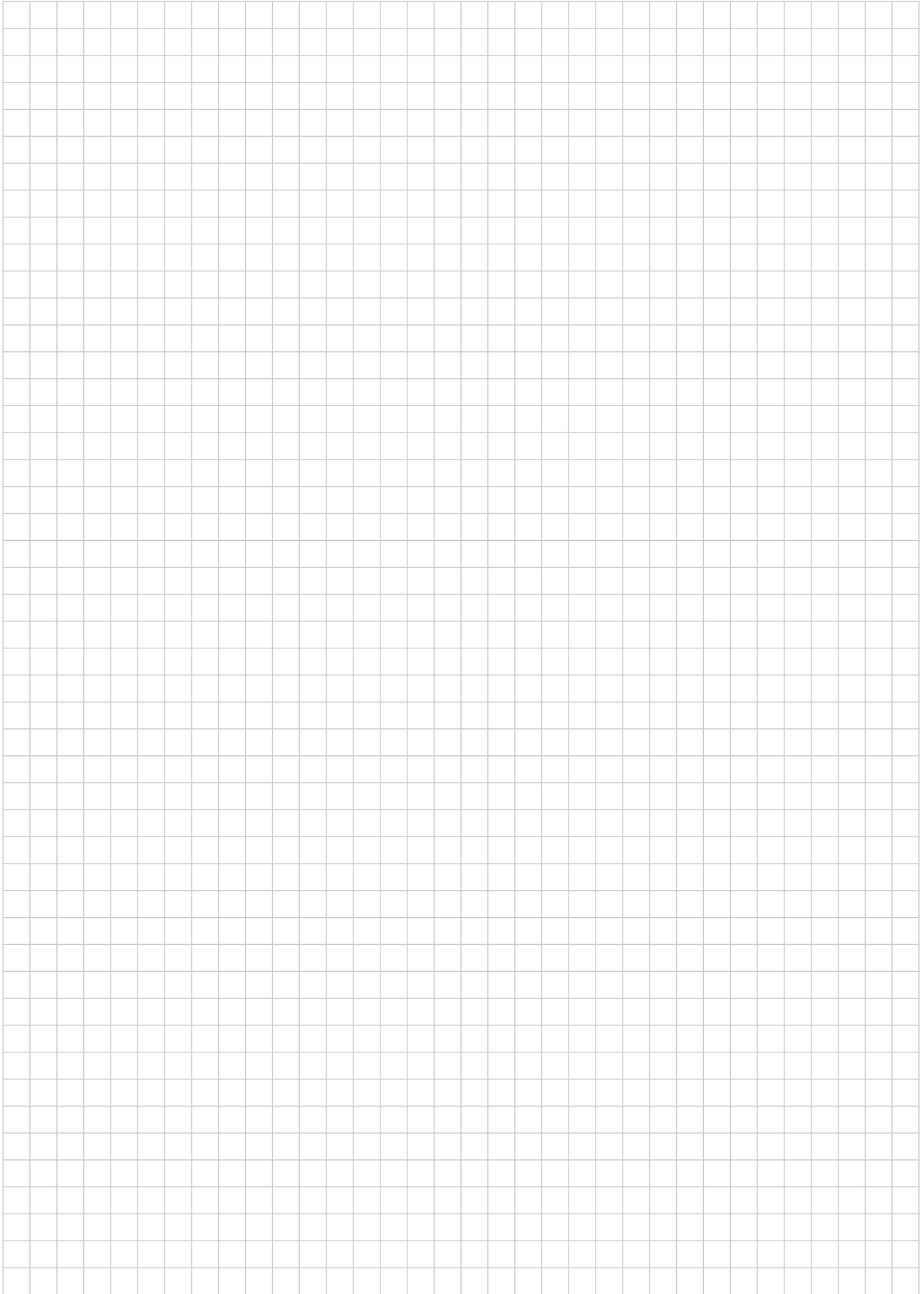
- (c) Tom estimates that the volume of air in the balloon is the same as the volume of a sphere of radius 11 m. Find Tom's estimate of the volume of air in the balloon.



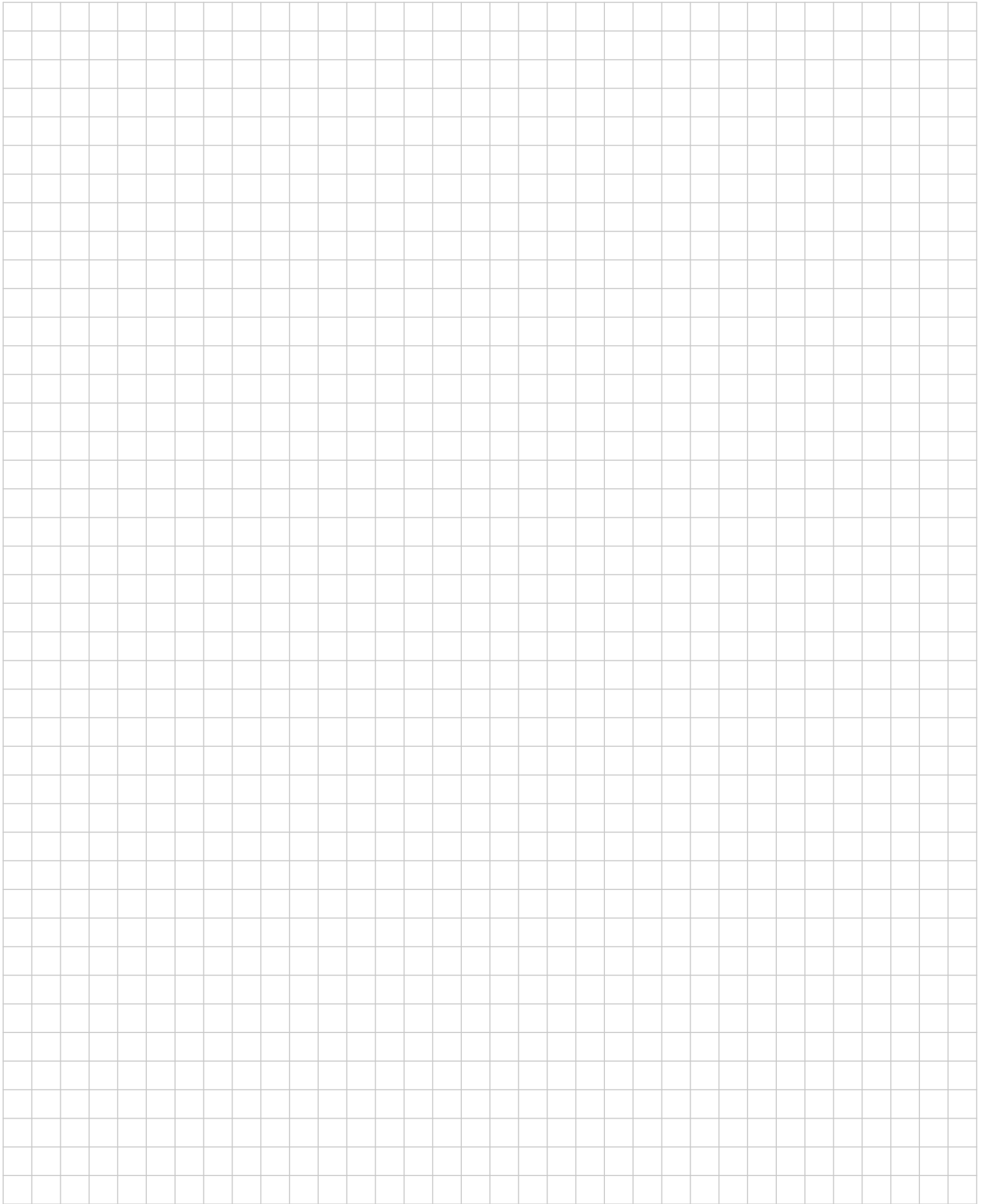
You may use this page for extra work



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