

SAMPLE PAPER 5

Leaving Certificate

Mathematics

Paper 2

Ordinary Level

Time: 2 hours, 30 minutes

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	
Total	

Grade

Instructions

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

Section A	Concepts and Skills	150 marks	6 questions
Section B	Contexts and Applications	150 marks	3 questions

Answer all nine questions

Write your answers in the spaces provided in this booklet. You will 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.

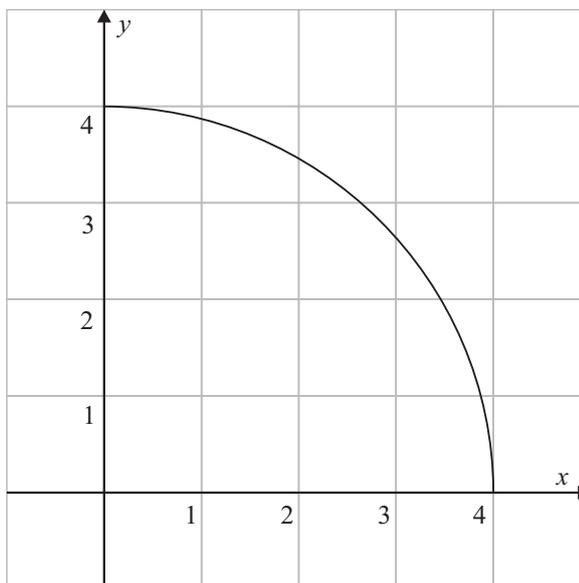
Write the make and model of your calculator(s) here:

Answer **all six** questions from this section.

Question 1

(25 marks)

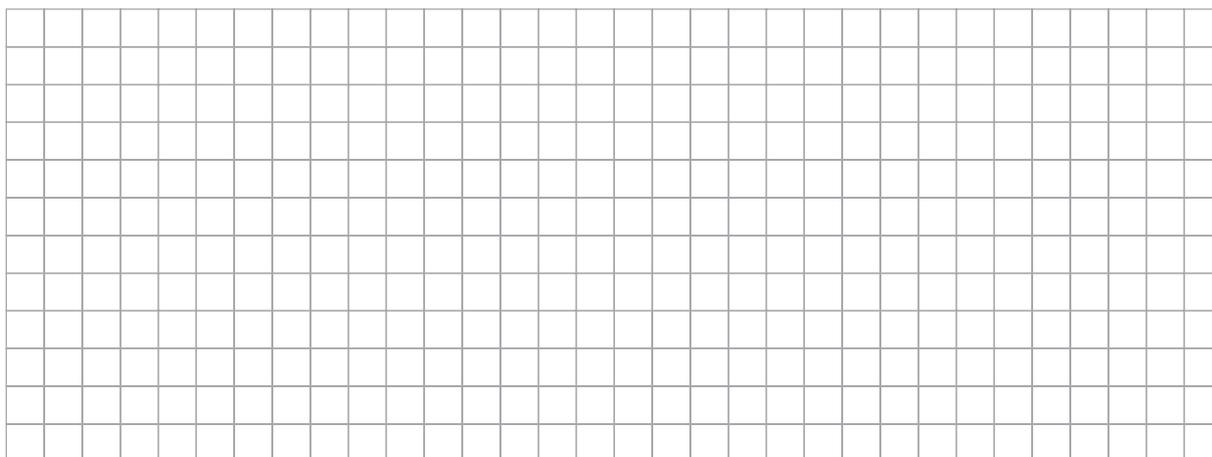
The diagram shows a quadrant of a circle with centre (0, 0) and radius 4. Its equation is given by $y = \sqrt{16 - x^2}$.



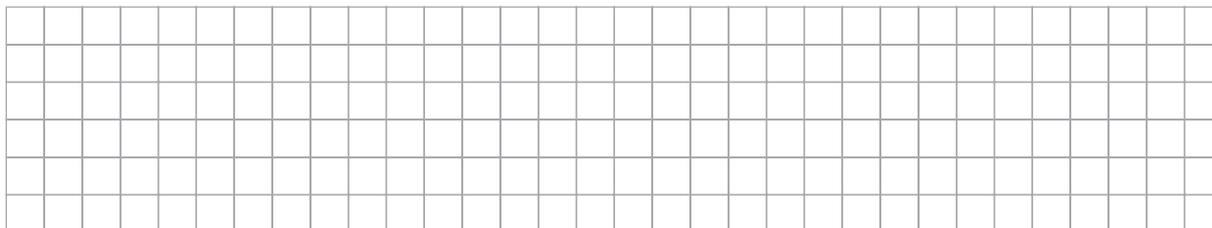
- (a) By completing the table below find the y values for the values of x shown. Give your answer exactly or to two decimal places.

x	y
0	
1	
2	
3	
4	

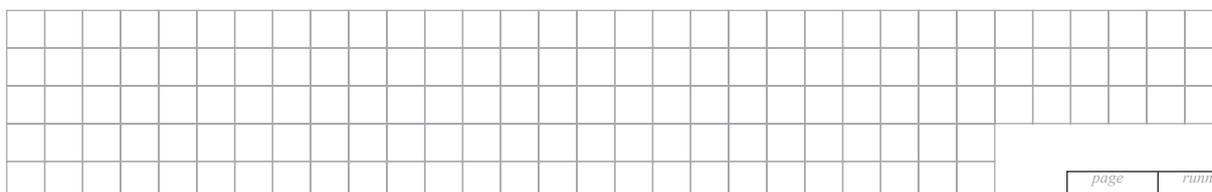
- (b) By splitting the area into four strips, estimate the area using the trapezoidal rule.



- (c) Find the area of the circle quadrant in terms of π , using the formula for the area of a circle.



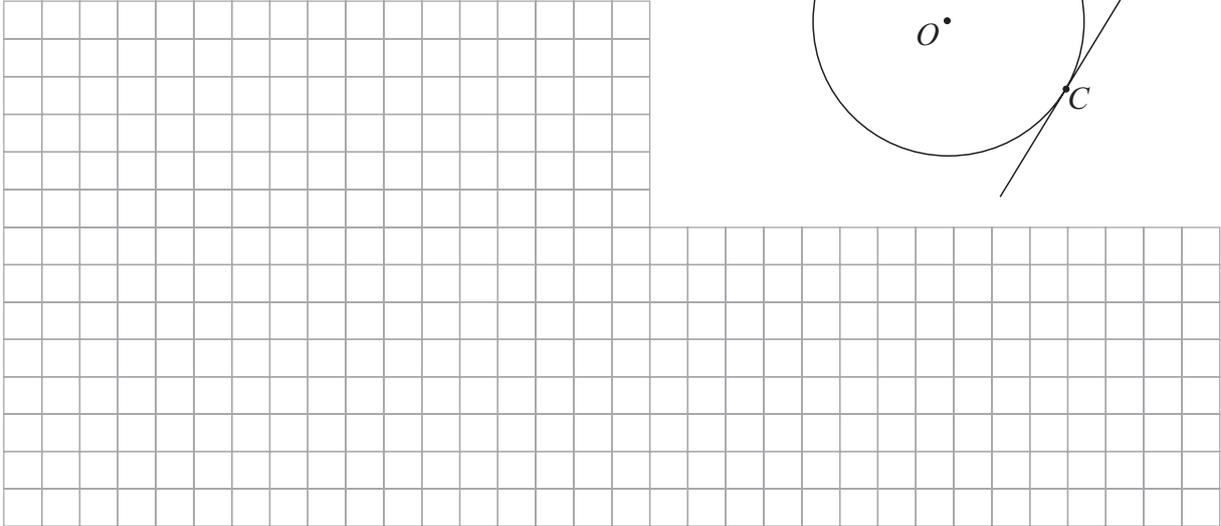
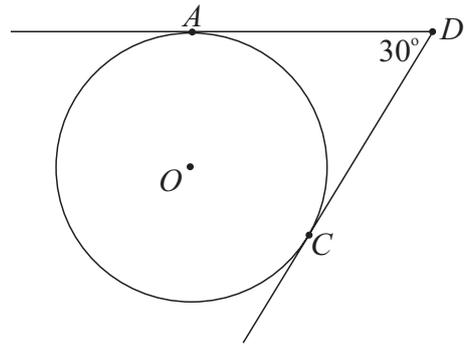
- (d) Use the answers for parts (b) and (c) to estimate π , to two decimal places.



Question 3

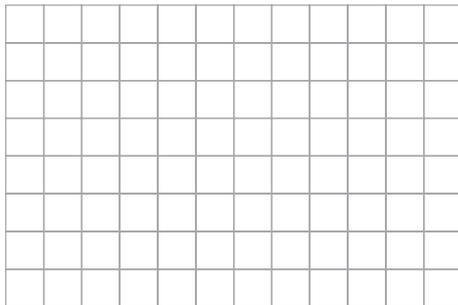
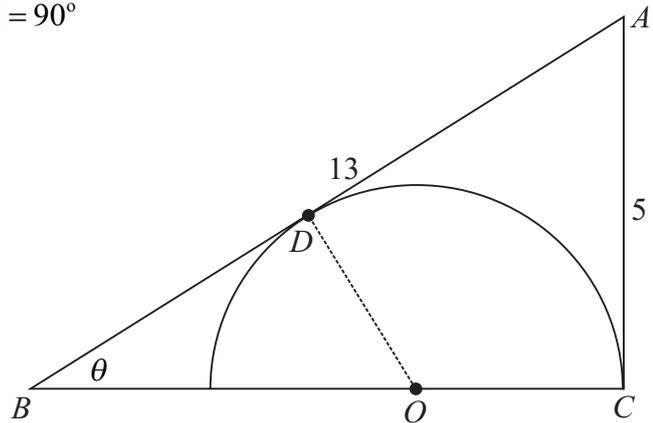
(25 marks)

- (a) AD and DC are tangent to a circle with centre O and radius 8 cm. If $|\angle ADC| = 30^\circ$, find the length of the minor arc AC , to one decimal place.

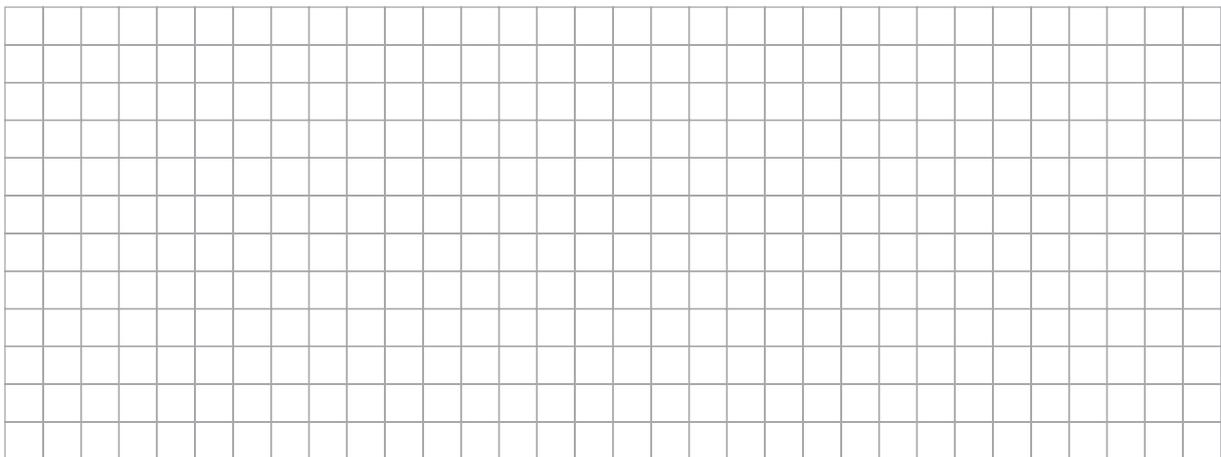


- (b) A semi-circle with centre O is inscribed inside a right-angled triangle ABC with $|\angle ACB| = 90^\circ$ and points B, O and C collinear.

- (i) Find $|BC|$.



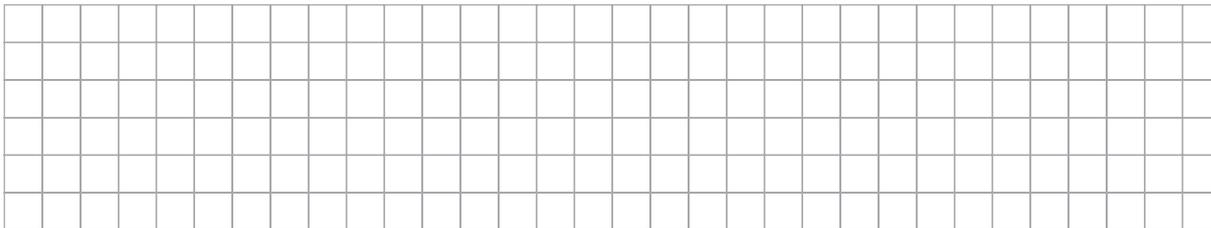
- (ii) Find $\sin \theta$ and hence, find the radius OD of the circle.



Question 4**(25 marks)**

l is the line $2x - 3y + k = 0$.

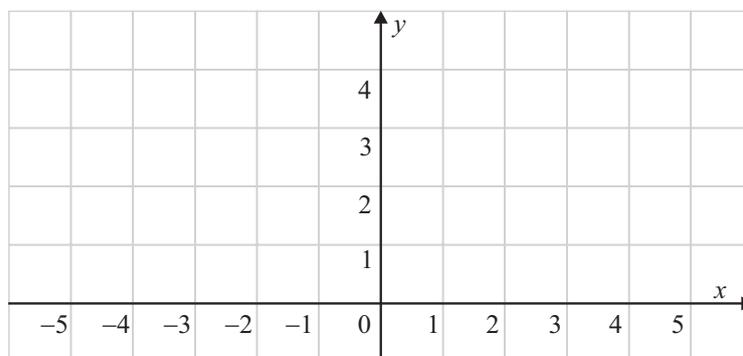
- (a) $(1, 4)$ is a point on l . Find k .



- (b) The line q is parallel to l and passes through the point $(5, 2)$. Find the equation of q .



- (c) The lines l and q together with the line $y = 2$ and the x -axis form a parallelogram. Find the vertices of the parallelogram. Sketch the parallelogram on the grid below.

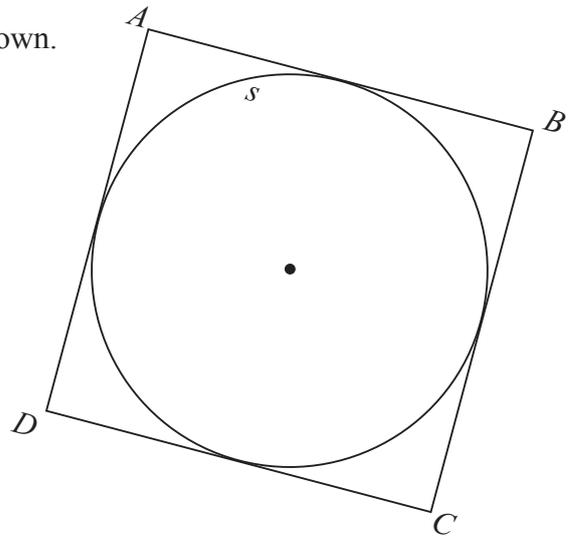


Question 5

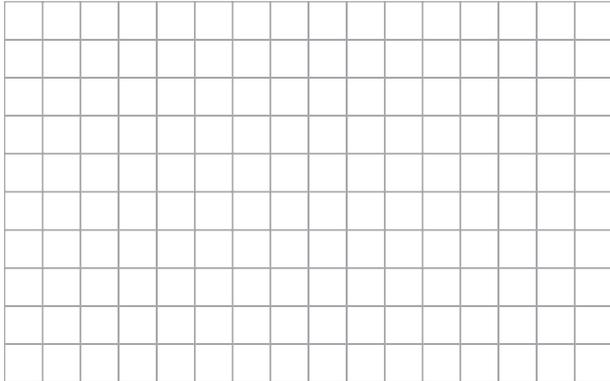
(25 marks)

The points $A(-1, 2)$, $B(-3, -4)$, $C(3, -6)$ and $D(5, 0)$ are the vertices of a square.

The sides of the square are tangents to the circle s , as shown.



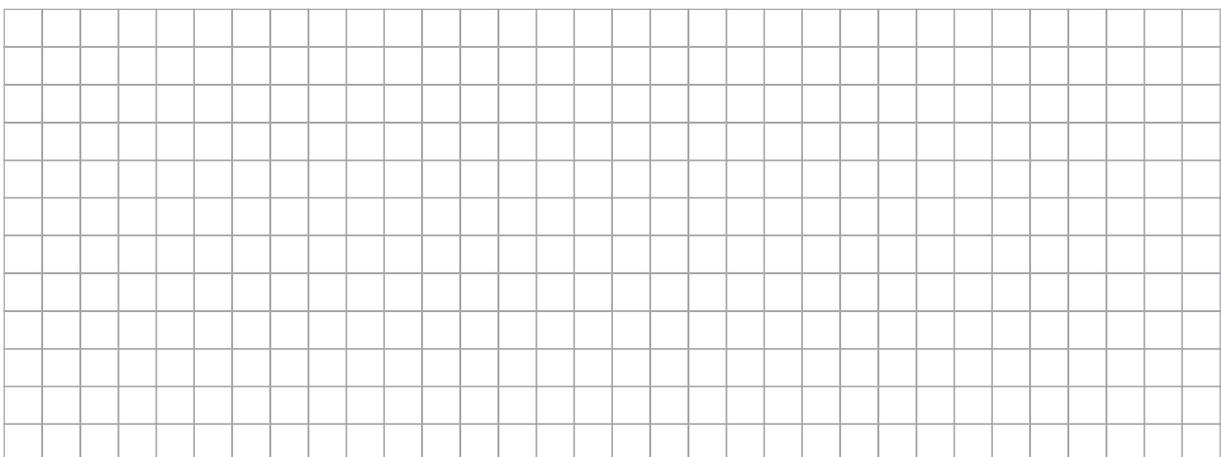
- (a) Find the coordinates of the centre of s .



- (b) Find the equation of s .



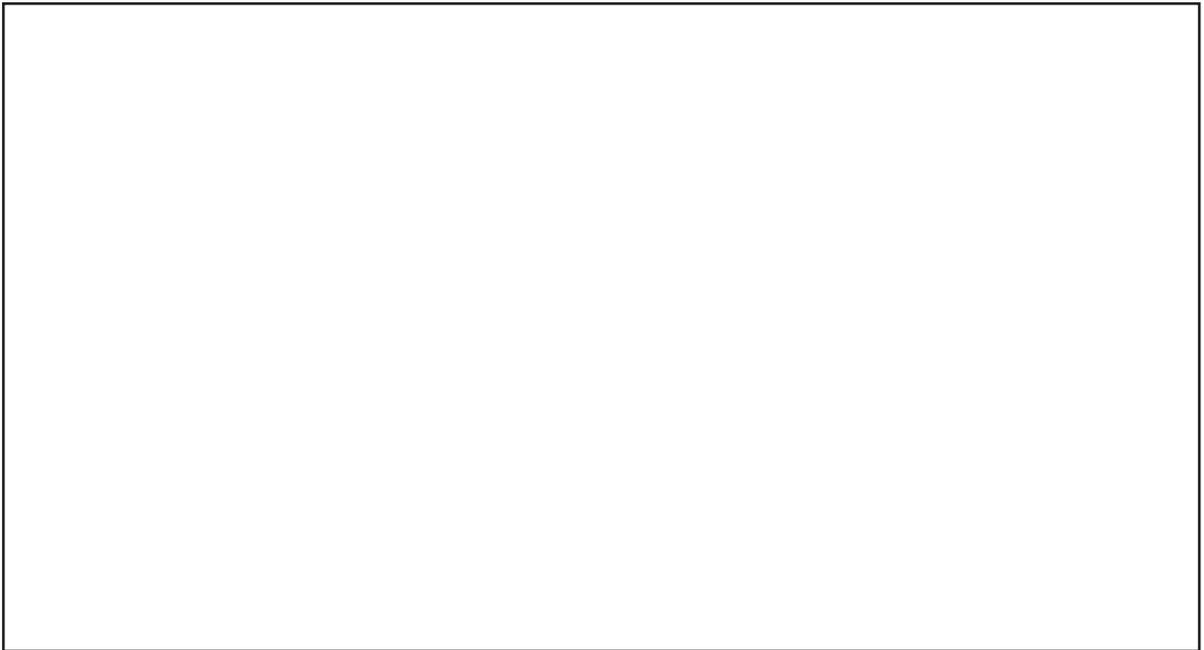
- (c) The circle $(x + 4)^2 + y^2 = 10$ is the image of s under the translation $(p, q) \rightarrow (6, 5)$. Find the value of p and the value of q .



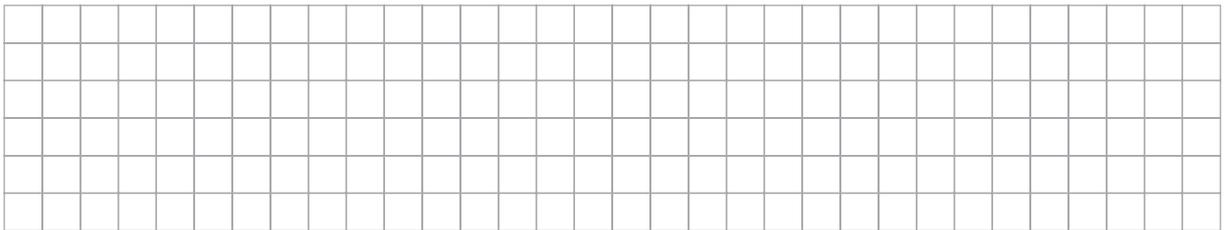
Question 6

(25 marks)

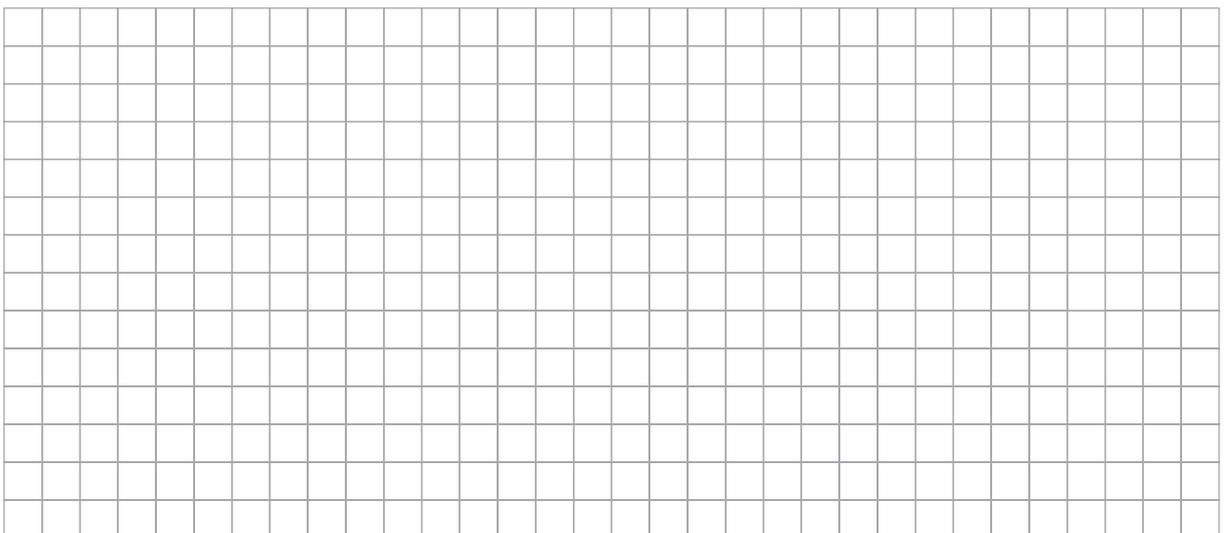
- (a) Draw a triangle ABC with sides $|BC| = 12$ cm, $|AB| = 9$ cm, and $|AC| = 10.5$ cm.



- (b) On this diagram, draw a line parallel to $[BC]$ through D on $[AB]$ such that $|BD| = 6$ cm. If this line intersects AC at E , write down the values of $|AE|$ and $|CE|$.



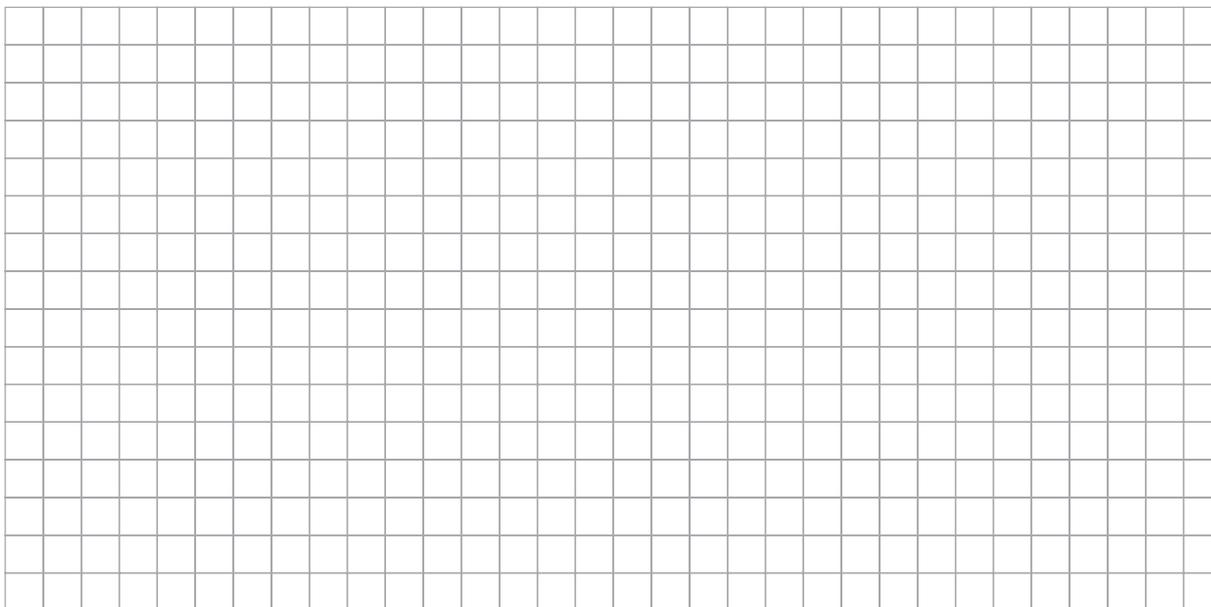
- (c) Say why triangles ADE and ABC are equiangular. Hence, write down the value of $|DE|$.



- (c) How far is it from the pitcher's mound (P) to third base (T)?
Give your answer correct to two decimal places.



- (d) Show that the pitcher's mound (P) is equidistant from the first and third bases.
Hence, find the acute angle between the line joining the pitcher's mound (P) and first base (F) with the line joining the pitcher's mound (P) to second base (S). Give your answer correct to the nearest degree.



- (e) The batter can run around the diamond at an average speed of 24 km h^{-1} .
How long does it take him to make a home run correct to one decimal place?

