



Geometry

Maths Past Exam Questions

Higher Level

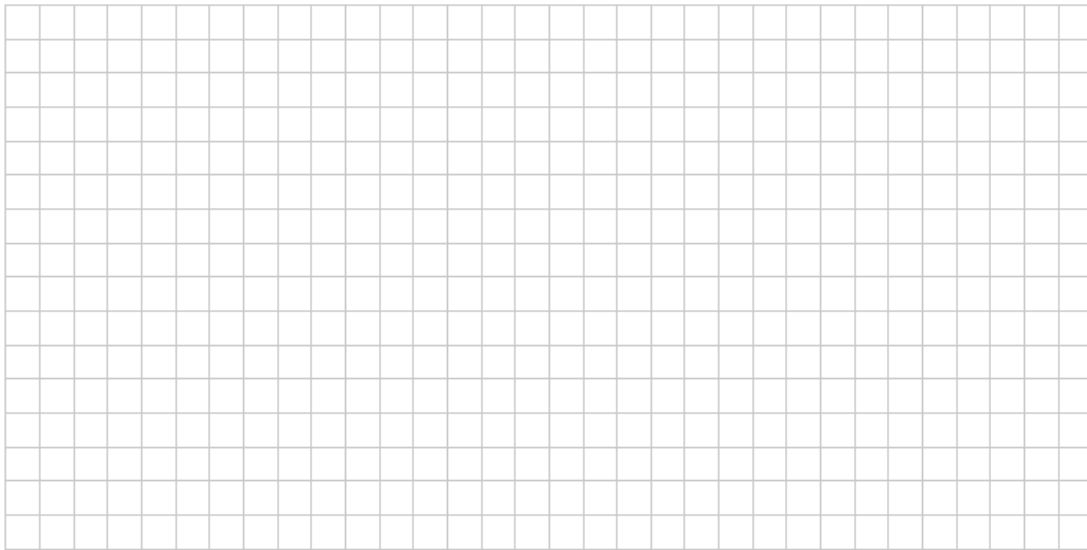
Paper 2 – Project Maths – Section A - Q5

Question 5

(25 marks)

- (a) In a triangle ABC , the lengths of the sides are a , b and c . Using a formula for the area of a triangle, or otherwise, prove that

$$\frac{a}{\sin \angle A} = \frac{b}{\sin \angle B} = \frac{c}{\sin \angle C}.$$



- (b) In a triangle XYZ , $|XY| = 5$ cm, $|XZ| = 3$ cm and $|\angle XYZ| = 27^\circ$.

- (i) Find the two possible values of $|\angle XZY|$. Give your answers correct to the nearest degree.



Paper 2 – Project Maths – Section A – Q6

Answer either 6A or 6B.

Question 6A

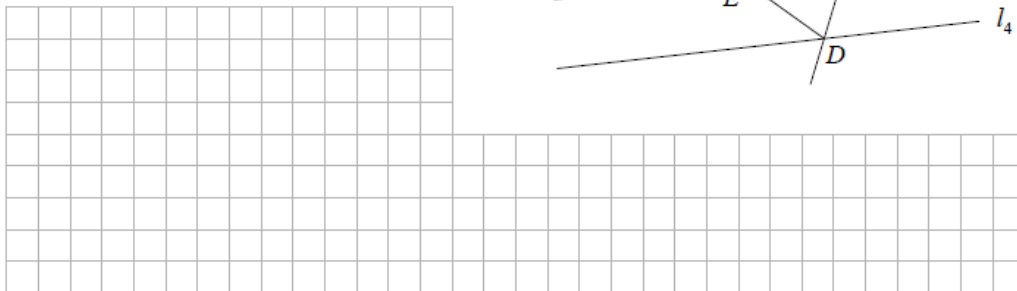
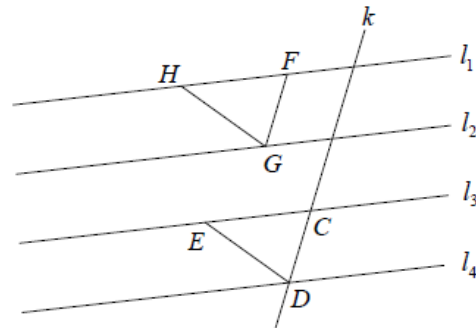
- (a) (i) Given the points B and C below, construct, without using a protractor or setsquare, a point A such that $|\angle ABC| = 60^\circ$.



- (ii) Hence construct, on the same diagram above, and using a compass and straight edge only, an angle of 15° .

- (b) In the diagram, $l_1, l_2, l_3,$ and l_4 are parallel lines that make intercepts of equal length on the transversal k . FG is parallel to k , and HG is parallel to ED .

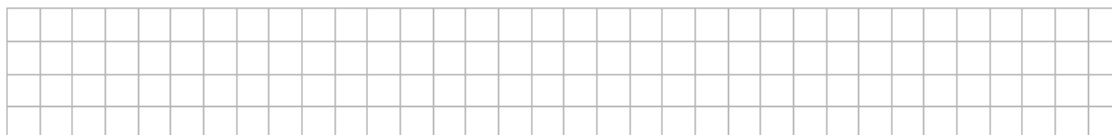
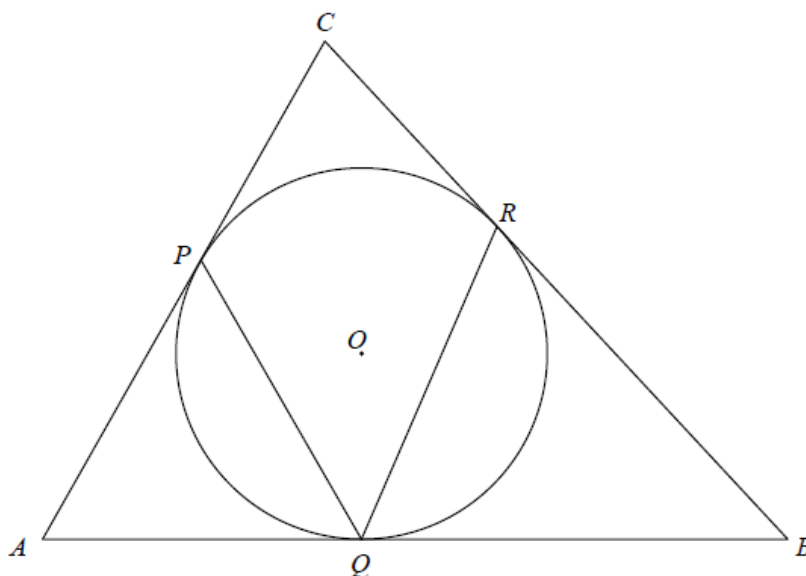
Prove that the triangles $\triangle CDE$ and $\triangle FGH$ are congruent.



Question 6B

The incircle of the triangle ABC has centre O and touches the sides at P , Q and R , as shown.

Prove that $|\angle PQR| = \frac{1}{2}(|\angle CAB| + |\angle CBA|)$.

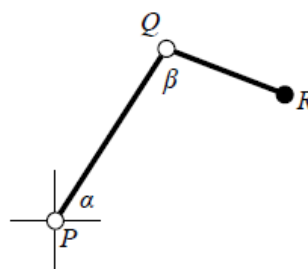


Q8

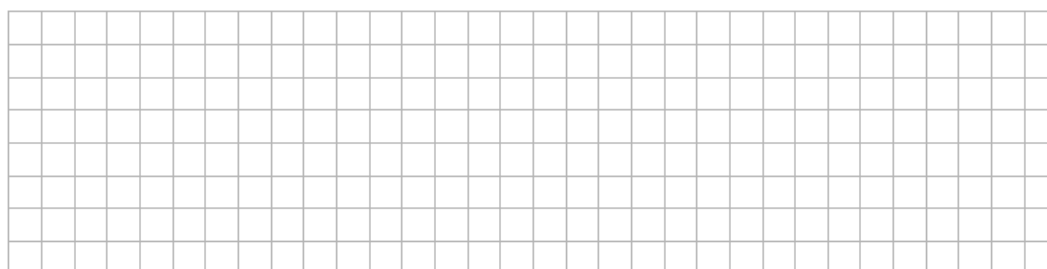
Question 8

(75 marks)

The diagram is a representation of a robotic arm that can move in a vertical plane. The point P is fixed, and so are the lengths of the two segments of the arm. The controller can vary the angles α and β from 0° to 180° .



- (a) Given that $|PQ| = 20$ cm and $|QR| = 12$ cm, determine the values of the angles α and β so as to locate R , the tip of the arm, at a point that is 24 cm to the right of P , and 7 cm higher than P . Give your answers correct to the nearest degree.

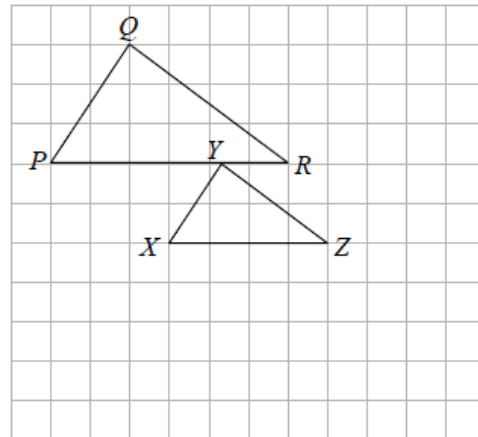


Paper 2 – Project Maths – Section A – Q4

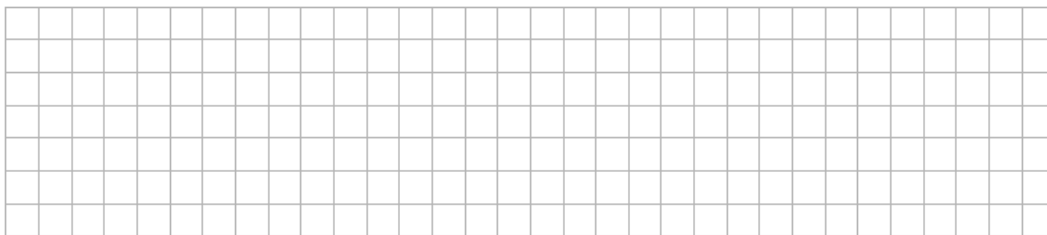
Question 4

(25 marks)

Two triangles are drawn on a square grid as shown. The points P , Q , R , X , and Z are on vertices of the grid, and the point Y lies on $[PR]$. The triangle PQR is an enlargement of the triangle XYZ .



- (a) Calculate the scale factor of the enlargement, showing your work.



- (b) By construction or otherwise, locate the centre of enlargement on the diagram above.

- (c) Calculate $|YR|$ in grid units.

