Higher Mathematics

Straight Lines - **Questions** - 2013-2017

Marks are indicated in brackets after each question number

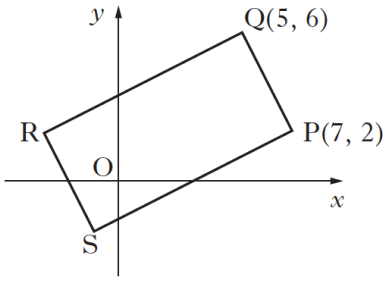
2013 Paper 1 Question 5, (2)

The line L passes through the point (–2, –1) and is parallel to the line with equation $5x + 3y - 6 = 0$.

What is the equation of L?

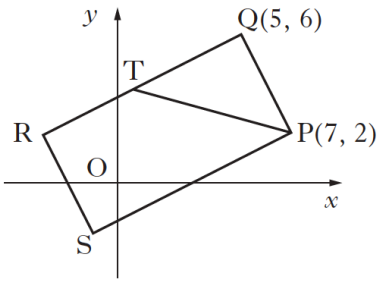
2013 Paper 2 Question 2, (3) (3) (3)

The diagram shows rectangle PQRS with P(7, 2) and Q(5, 6).



(*a*) Find the equation of QR.

(*b*) The line from P with the equation $x + 3y = 13$ intersects QR at T.

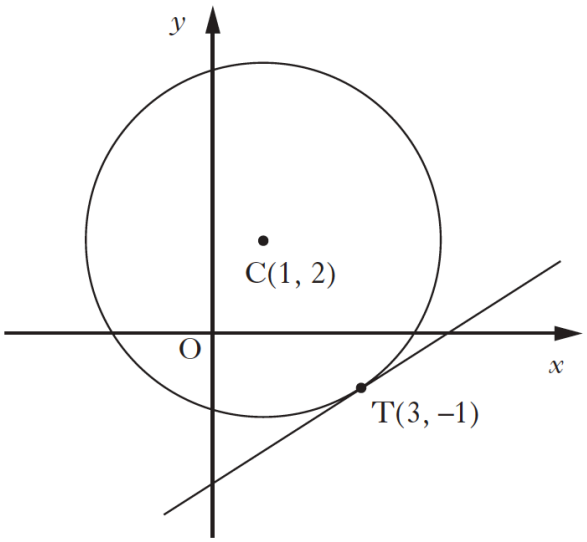


Find the coordinates of T.

(*c*) Given that T is the midpoint of QR, find the coordinates of R and S.

2014 Paper 1 Question 2, (2)

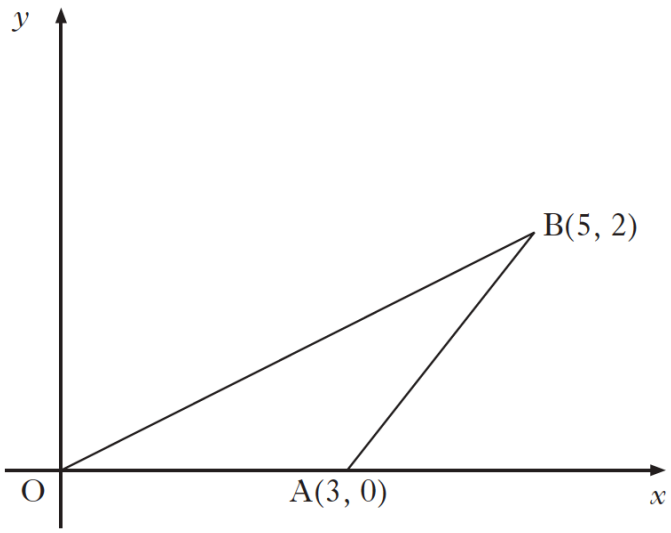
The diagram shows a circle with centre C(1, 2) and the tangent at T(3, –1).



What is the gradient of this tangent?

2014 Paper 2 Question 1, (4) (2) (2)

A(3, 0), B(5, 2) and the origin are the vertices of a triangle as shown in the diagram.



(*a*) Obtain the equation of the perpendicular bisector of AB.

(*b*) The median from A has equation $y + 2x = 6$.

Find T, the point of intersection of this median and the perpendicular bisector of AB.

(*c*) Calculate the angle that AT makes with the positive direction of the x-axis.

2015 Paper 1 Question 9, (3)

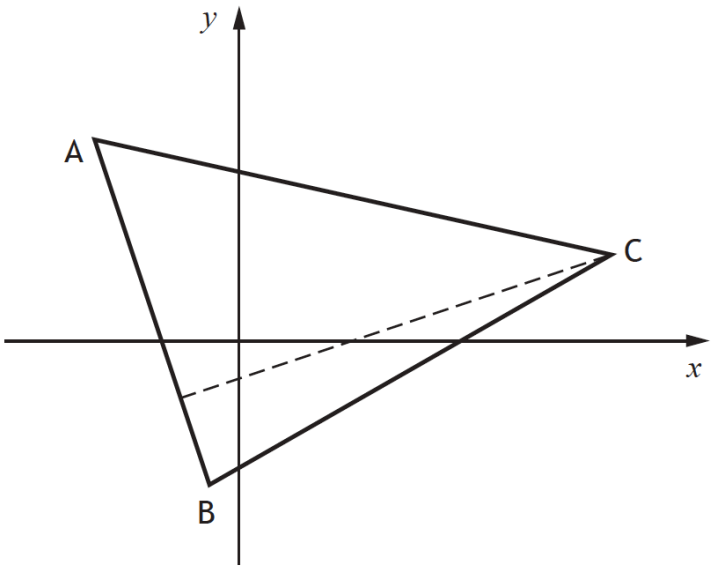
A, B and C are points such that AB is parallel to the line with equation $y + \sqrt{3}x = 0$ and BC makes an angle of $150°$ with the positive direction of the x-axis.

Are the points A, B and C collinear?

2015 Paper 2 Question 1, (4) (3)

The vertices of triangle ABC are A$(-5, 7)$, B$(-1, -5)$ and C$(13, 3)$ as shown in the diagram.

The broken line represents the altitude from C.



(a) Show that the equation of the altitude from C is $x - 3y = 4$.

(b) Find the equation of the median from B.

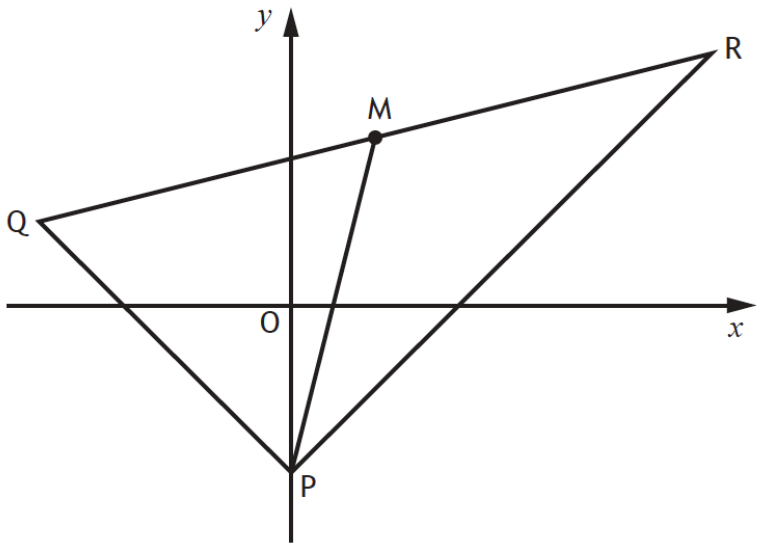
(c) Find the coordinates of the point of intersection of the altitude from C and the median from B.

2016 Paper 1 Question 1, (2)

Find the equation of the line passing through the point $(-2, 3)$ which is parallel to the line with equation $y + 4x = 7$.

2016 Paper 2 Question 1, (1) (2) (3)

PQR is a triangle with vertices $P(0,-4)$, $Q(-6,2)$ and $R(10,6)$.



(a) (i) State the coordinates of M, the midpoint of QR.

(ii) Hence find the equation of PM, the median through P.

(b) Find the equation of the line, L, passing through M and perpendicular to PR.

(c) Show that line L passes through the midpoint of PR.

2017 Paper 1 Question 7, (3)

A $(-3, 5)$, B $(7, 9)$ and C $(2, 11)$ are the vertices of a triangle.

Find the equation of the median through C.

2017 Paper 1 Question 11, (3)

A and B are the points $(-7, 2)$ and $(5, a)$.

AB is parallel to the line with equation $3y - 2x = 4$.

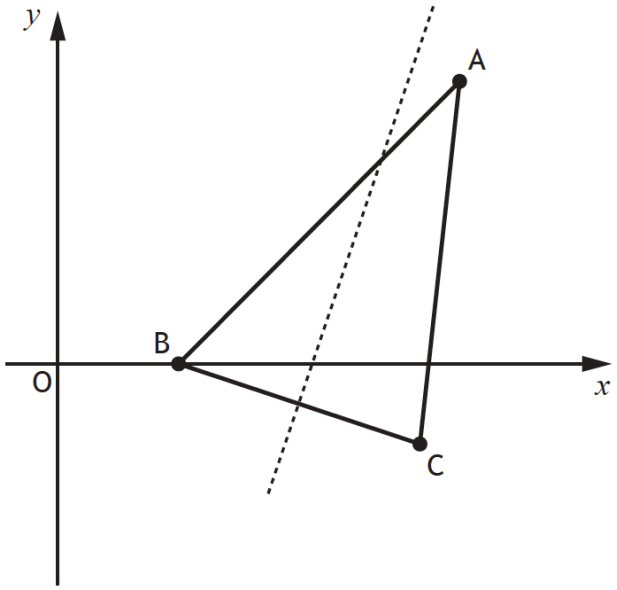
Determine the value of a.

2017 Paper 2 Question 1, (4) (2) (2)

Triangle ABC is shown in the diagram below.

The coordinates of B are (3,0) and the coordinates of C are (9,−2).

The broken line is the perpendicular bisector of BC.



(a) Find the equation of the perpendicular bisector of BC.

(b) The line AB makes an angle of 45° with the positive direction of the x-axis.
Find the equation of AB.

(c) Find the coordinates of the point of intersection of AB and the perpendicular bisector of BC.