

EDEXCEL O'LEVEL PURE MATHEMATICS TOPIC WISE QUESTIONS PAPERS
COORDINATE GEOMETRY

1. The point A has coordinates $(3, 0)$ and the point B has coordinates $(2, 2)$.
The line L_1 passes through B and is perpendicular to AB .

(a) Find an equation of L_1

Give your answer in the form $ax + by + c = 0$

(5)

The line L_2 with equation $x - 7y - 3 = 0$ intersects the line L_1 at the point C .
The midpoint of AC is M .

(b) Find the coordinates of M .

(5)

(c) Find the area of the triangle ABM .

(4)

January 2020/Q6/P1

2. The points P , Q , R and S have coordinates $(4, 7)$, $(3, 0)$, $(10, 1)$ and $(11, 8)$ respectively.

(a) Show, by calculation, that the lines PR and QS are perpendicular.

(3)

(b) Find the exact lengths of (i) PR (ii) QS

(2)

(c) Find the area of the quadrilateral $PQRS$

(2)

June2020/Q5/P1

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3. The curve C_1 has equation $y = 5e^{-2x} + 4$

The curve C_2 has equation $y = e^{2x}$

The curves C_1 and C_2 intersect at the point A .

(a) Find the exact coordinates of A .

(4)

The tangent at A to C_1 intersects the x -axis at the point B .

(b) Show that the x coordinate of B is $\frac{1}{2}(5 + \ln 5)$

(5)

The tangent at A to C_2 intersects the x -axis at the point D .

(c) Find the area of $\triangle ABD$.

(6)

October 2020/Q8/P2

4. The point A has coordinates $(-4, -10)$ and the point B has coordinates $(3, 11)$
The line l passes through A and B .

(a) Find an equation of l .

(2)

The point P lies on l such that $AP:PB = 3:4$

(b) Find the coordinates of P .

(2)

The point Q with coordinates (m, n) , where $m < 0$, lies on the line through P that is perpendicular to l .

Given that the length of PQ is $\sqrt{10}$

(c) find the coordinates of Q .

(6)

The point R has coordinates $(-11, -21)$

(d) Show that

(i) AB and RQ are equal in length,

(ii) AB and RQ are parallel.

(4)

(e) Find the area of the quadrilateral $ABQR$.

(2)

June 2021/Q4/P2

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5. The points A and B have coordinates $(-3, -5)$ and $(7, 5)$ respectively.

(a) Find an equation for the line AB

(2)

The point C has coordinates $(p, 1)$ where $p < 0$

Given that AC and BC are perpendicular,

(b) prove that $p = -5$

(7)

The point D , where BCD is a straight line, is such that C divides BD in the ratio $4:3$

(c) Find the coordinates of D

(2)

(d) (i) Find the exact length of AC

(ii) Hence, or otherwise, find the area of triangle ABD

(4)

October 2021/Q11/P2

6. The equation of the line L_1 is $y - 2x - 6 = 0$

The point P with coordinates $(2, a)$ lies on L_1

(a) Find the value of a

(1)

The line L_2 is perpendicular to L_1 and passes through P

(b) Show that an equation of L_2 is $x + 2y - 22 = 0$

(4)

Line L_1 crosses the x -axis at the point A and line L_2 crosses the x -axis at the point B

The point C has coordinates (m, n) such that $m > 0$ and $n < 0$

The length of AC is $5\sqrt{2}$ and the gradient of BC is $\frac{1}{4}$

(c) Find the value of m and the value of n

(9)

(d) Find the area of quadrilateral $ACBP$

(3)

January 2022/Q10/P1

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7. The point A has coordinates $(-5, 3)$, the point B has coordinates $(4, 0)$ and the point C has coordinates $(-1, 5)$.

The line l passes through C and is perpendicular to AB .

- (a) Find an equation of l .

Give your answer in the form $ax + by + c = 0$ where a , b and c are integers.

(4)

The line l intersects AB at the point D .

- (b) Show that the coordinates of D are $(-2, 2)$.

(3)

- (c) Show that l is not the perpendicular bisector of AB .

(2)

- (d) Find the value of $\tan \angle ABC$.

Give your answer in its simplest form.

(4)

January 2023/Q2/P1

8. The straight line L_1 passes through the point A with coordinates $(4, 7)$ and has gradient m , where $m < 0$

Another straight line L_2 is perpendicular to L_1 and passes through the point B with coordinates $(4, k)$ where $k \neq 7$

The lines L_1 and L_2 intersect at the point C .

Given that the y coordinate of C is Y

- (a) show that $Y = \frac{7 + m^2k}{m^2 + 1}$

(7)

Given that the triangle ABC is isosceles,

- (b) find the value of m

(5)

June2022/Q9/P2

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9. The points A and B have coordinates $(-6, 8)$ and $(12, 2)$ respectively.
- (a) Find an equation of the straight line passing through A and B in the form $ax + by + c = 0$, where a , b and c are integers to be found. (3)
- (b) Find the exact length of AB (2)
- The point X with coordinates (m, n) lies on AB such that $AX:XB = 1:2$
- (c) Find the value of m and the value of n (2)
- The line L passes through the point X and is perpendicular to AB
The point C with coordinates (p, q) lies on L where $p > 0$ and $q > 0$
- Given that AB is a diameter of a circle and C also lies on the circumference of the circle,
- (d) find
- (i) the exact value of p
- (ii) the exact value of q (7)
- (e) Find the exact area of triangle ABC (3)

June2023/Q8/P2

10. The point A with coordinates $(12, 14)$ and the point B with coordinates $(q, 2)$ where q is a constant, lie on the straight line with equation $3y - 2x - p = 0$ where p is a constant.
- (a) Find the value of p and the value of q (3)
- The line L is perpendicular to AB and passes through the point X , which lies on AB such that $AX:XB = 1:2$
- (b) Find an equation for L in the form $ax + by + c = 0$ where a , b and c are integers to be found. (6)

October 2023/Q4/P1

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11. The line l passes through the point A with coordinates $(-2, 2)$ and the point B with coordinates $(3, 12)$

The point C with coordinates (p, q) lies on l such that $AC : CB = 3 : 2$

- (a) Find the value of p and the value of q

(2)

The line k is perpendicular to l and passes through the point C

- (b) Show that an equation of k is $2y + x - 17 = 0$

(4)

The line k crosses the x -axis at the point D

- (c) Find the exact length of CD

(3)

The point X with coordinates (m, n) lies on l such that

$$\text{area of triangle } DXC = 80 \text{ units}^2$$

Given that $m > 0$

- (d) find the value of m and the value of n

(7)

June2024/Q6/P1

12. The point A has coordinates $(3, 2)$, the point B has coordinates $(8, 3)$ and the point C has coordinates $(4, 7)$

- (a) Show that ABC is an isosceles triangle.

(2)

The midpoint of BC is M

- (b) Find an equation of the line that passes through A and M

Give your answer in the form $y = mx + c$

(3)

The points A , C and D are collinear such that $AD = kAC$ ($k > 1$)

Given that $\angle ABD = 90^\circ$

- (c) find the coordinates of D
Show your working clearly.

(8)

June2025/Q2/P2