



ANALYTICAL GEOMETRY

MATHEMATICS GRADE 10

**REVISION PACK
PAST PAPERS**

JANUARY 1, 2018

QUESTION 4 BISHOP 07

Given A(-2; -3), B(5; -2), C(10; 3) and D(3; 2).

4.1 Prove that $AC \perp BD$ (3)

4.2 Find the midpoint of AC and of BD (4)

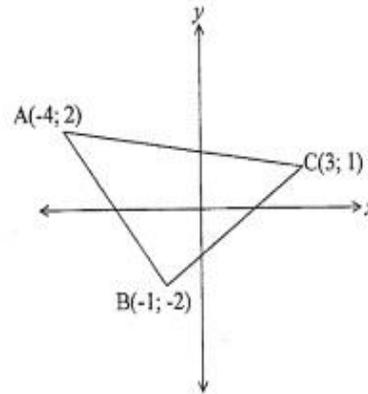
midpoint of AC is

midpoint of BD is

4.3 Using the information above, describe what kind of figure ABCD is. Justify your answer. (4)
[11]

QUESTION 5

Points A(-4; 2), B(-1; -2) and C(3; 1) are given.



5.1 Prove that $AB \perp BC$ (3)

5.2 Prove that $\triangle ABC$ is an isosceles triangle (3)

5.3 Find the area of $\triangle ABC$ (3)

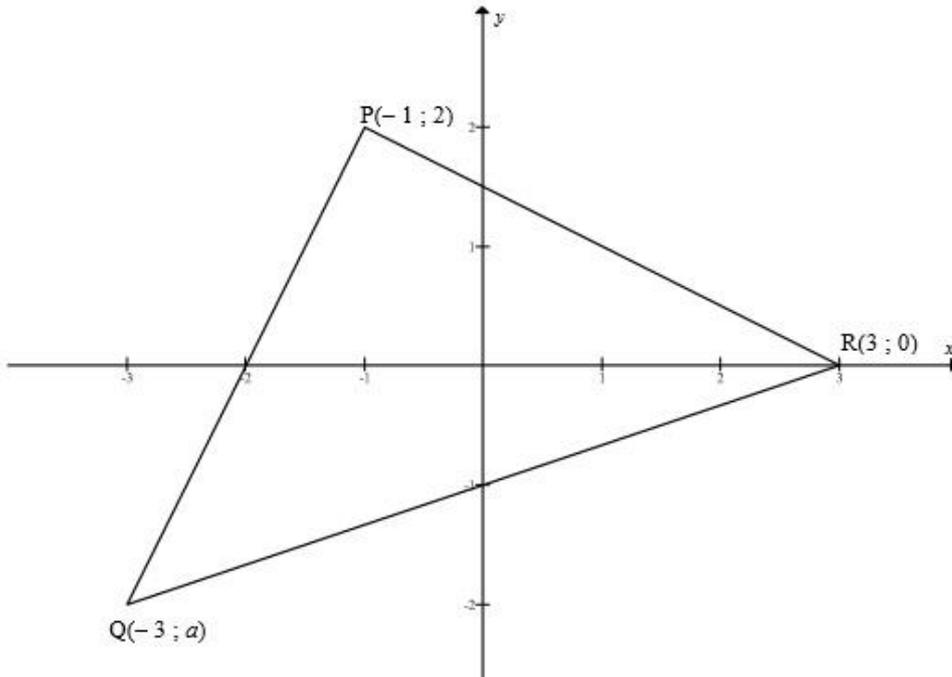
5.4 Find the co-ordinates of the midpoints of AB and BC.
Call the midpoints D and E respectively (4)

5.5 Show that $AC \parallel DE$ (3)

5.6 Determine the co-ordinates of F if ABCF is a square (2)
[18]

QUESTION1 NOV 07

$P(-1 ; 2)$, $R(3 ; 0)$ and $Q(-3 ; a)$ are the vertices of a triangle in the Cartesian plane and $PQ = PR$.

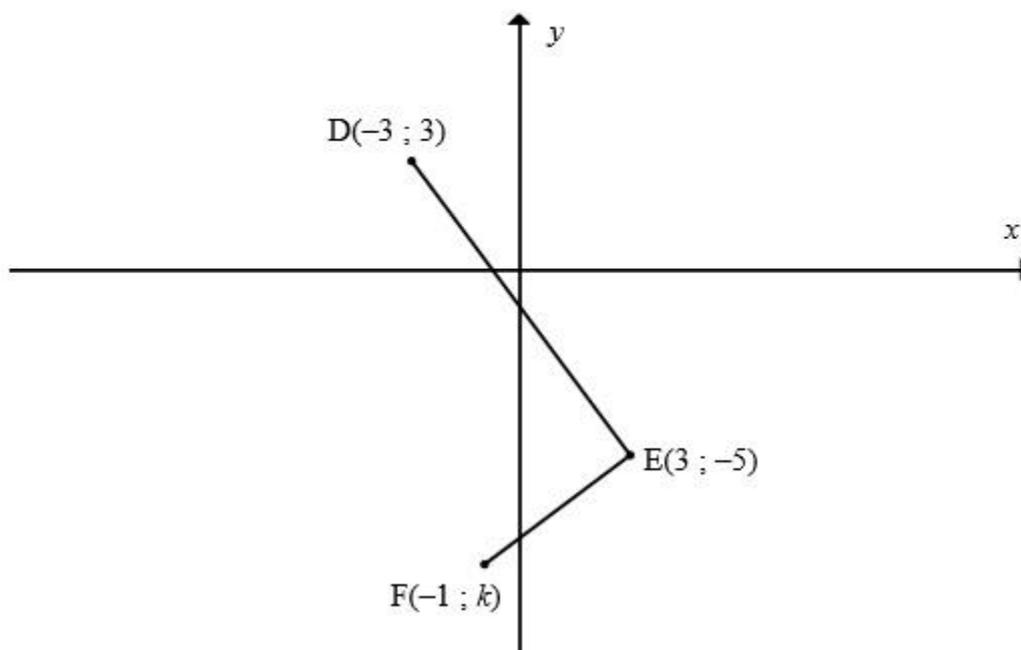


- 1.1 Determine the coordinates of E, the midpoint of PR. (4)
- 1.2 Show that $a = -2$ if the midpoint of QR is $(0 ; -1)$ (3)
- 1.3 Determine the gradient of EQ. (3)
- 1.4 Calculate the distance of PQ. (3)
- 1.5 Calculate the distance of QR. (2)
- 1.6 Show that ΔPQR is right-angled at P if $QR = \sqrt{40}$ (4)
- 1.7 Calculate the area of ΔPQR . (3)
- 1.8 Write down the ratio of area ΔPQE : area ΔPQR . (1)

[23]

QUESTION 3 EXEMPLAR 12

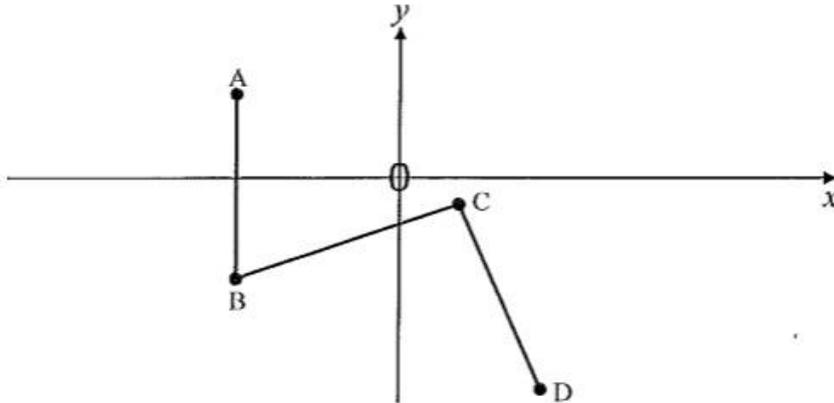
- 3.1 In the diagram below, $D(-3 ; 3)$, $E(3 ; -5)$ and $F(-1 ; k)$ are three points in the Cartesian plane.



- 3.1.1 Calculate the length of DE. (2)
- 3.1.2 Calculate the gradient of DE. (2)
- 3.1.3 Determine the value of k if $\hat{DEF} = 90^\circ$. (4)
- 3.1.4 If $k = -8$, determine the coordinates of M, the midpoint of DF. (2)
- 3.1.5 Determine the coordinates of a point G such that the quadrilateral DEFG is a rectangle. (4)
- 3.2 C is the point $(1 ; -2)$. The point D lies in the second quadrant and has coordinates $(x ; 5)$. If the length of CD is $\sqrt{53}$ units, calculate the value of x . (4)
- [18]

QUESTION 2 HUD NOV 12

2. In the diagram below, $A(-5; 3)$, $B(-5; -4)$, $C(2; -1)$ and $D(5; -8)$:



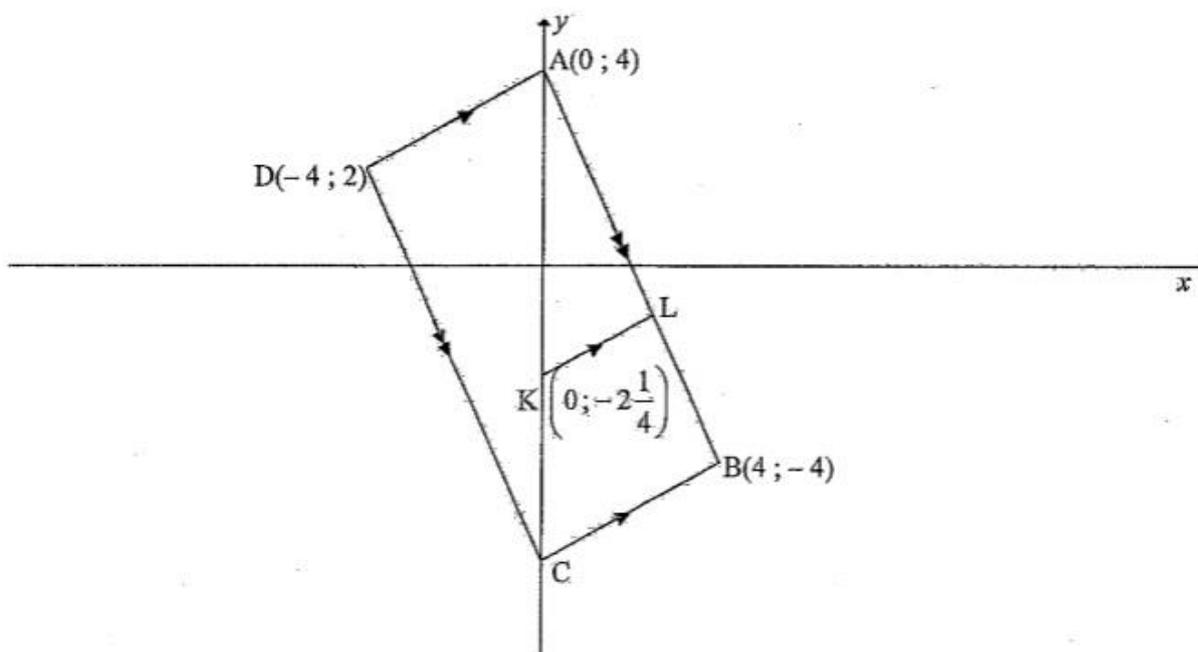
- 2.1. Determine the equations of the lines through :
 - 2.1.1. B and C 3
 - 2.1.2. A and B 1 (4)
- 2.2. State the gradient of any line parallel to BC. (1)
- 2.3. Prove that : $\widehat{BCD} = 90^\circ$ (3)
- 2.4. Write down the coordinates of E, if AECB is a parallelogram. (2)

QUESTION 3 [13 marks]

- 3.1. If $A(x; -3)$, $B(-1; 1)$ and $C(3; 7)$ are collinear, calculate the value of x . (4)
- 3.2. If $P(-2; y)$ is the midpoint of the line segment QR, where $Q(3; -4)$ and $R(x; -8)$, calculate the values of :
 - 3.2.1. y 1
 - 3.2.2. x 2 (3)
- 3.3. If $A(4; 5)$ is equidistant from $B(x; 1)$ and $C(8; -2)$, calculate the value(s) of x . (6)

QUESTION 3 NOV 15

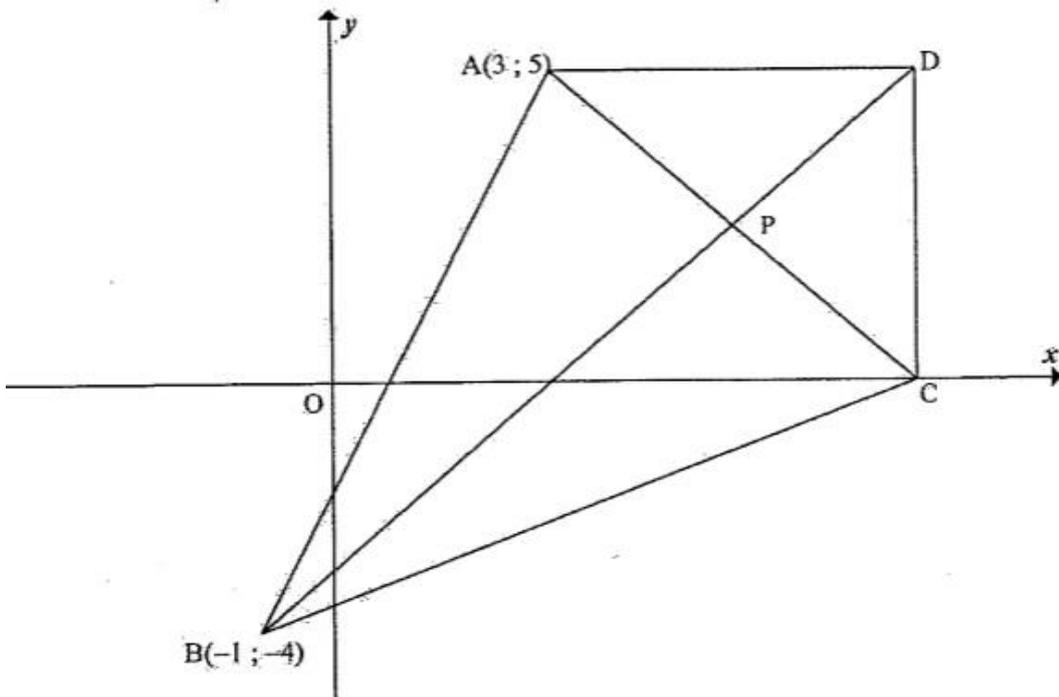
In the diagram, C is a point on the y -axis such that $A(0; 4)$, $B(4; -4)$, C and $D(-4; 2)$ are vertices of parallelogram $ABCD$. K is the point $\left(0; -2\frac{1}{4}\right)$ and L is a point on AB such that $KL \parallel CB$.



- 3.1 Calculate the length of diagonal DB . (3)
 - 3.2 Calculate the coordinates of M , the midpoint of DB . (3)
 - 3.3 Calculate the gradient of AD . (3)
 - 3.4 Prove that $AD \perp AB$. (3)
 - 3.5 Give a reason why parallelogram $ABCD$ is a rectangle. (1)
 - 3.6 Determine the equation of KL in the form $y = mx + c$. (2)
 - 3.7 Write down, with reasons, the coordinates of C . (3)
- [18]

QUESTION 3 NOV 16

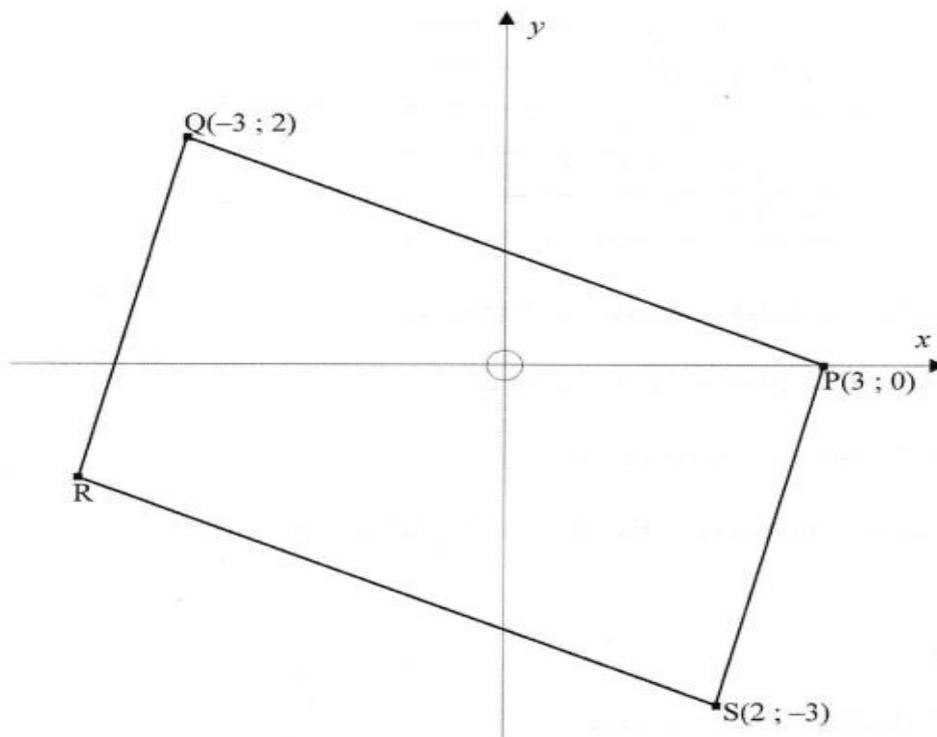
- 3.1 Show that a triangle ABC , with vertices $A(1 ; 1)$; $B(3 ; 6)$ and $C(6 ; 3)$, is an isosceles triangle. (4)
- 3.2 In the diagram below, $ADCB$ is a kite with $A(3 ; 5)$ and $B(-1 ; -4)$. $AD = DC$ and $AB = BC$. D is a point such that AD is parallel to the x -axis and $AD = 5$ units. CD is perpendicular to the x -axis. The diagonals intersect at P .



- 3.2.1 Show that the coordinates of C are $(8 ; 0)$. (2)
- 3.2.2 Write down the coordinates of point P . (2)
- 3.2.3 Calculate the gradient of line BD . (2)
- 3.2.4 Calculate the length of line AC . (2)
- 3.2.5 Calculate the area of the kite $ADCB$. (3)
- [15]

QUESTION 1 SEP 17

In the diagram below $P(3 ; 0)$, $Q(-3 ; 2)$, R and $S(2 ; -3)$ are four points in the Cartesian plane.



- 1.1 Calculate the gradient of PQ . (2)
 - 1.2 Determine the equation of line RS which is parallel to line PQ . (4)
 - 1.3 Determine the equation of a line that is perpendicular to line RS and passes through the point $(0 ; -2)$. (2)
 - 1.4 Calculate the length of PS . Leave your answer in surd form. (2)
 - 1.5 Prove that $QP \perp PS$. (3)
 - 1.6 Determine the co-ordinates of R if $PQRS$ is a rectangle. (2)
- [15]**