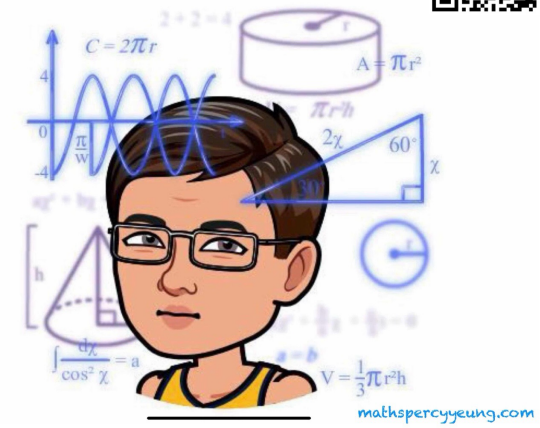


S1

Mathematics

Past Exam Paper (1314–2223)

Question Book

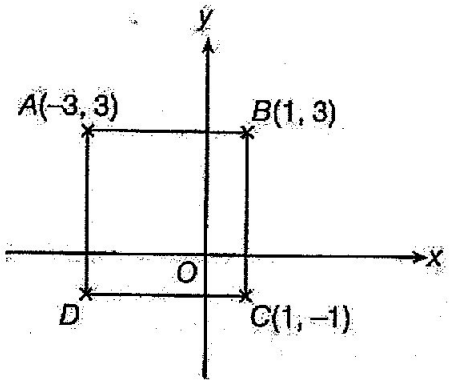
Ch10 Introduction to Coordinates

UCCKE F1 Ch10 Introduction to Coordinates

Ch10 Introduction to Coordinates

[1314 S.1 2nd Exam MC Q5]

1. In the figure below, $ABCD$ is a square. Which of the following are the coordinates of D?



A. $(-1,-3)$
B. $(1,-3)$
C. $(-3,3)$
D. $(-3,-1)$

[1314 S.1 2nd Exam MC Q6]

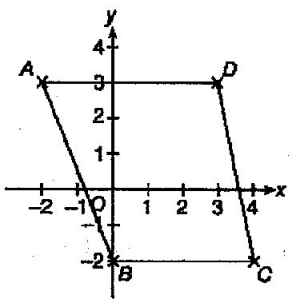
2. Find the length of the line segment formed by $A(-1,5)$ and $B(-1,-5)$.
   A. 10 units
   B. 6 units
   C. 2 units
   D. 0 units

[1314 S.1 2nd Exam MC Q7]

3. Find the coordinates of the image when $A(3, 1)$ is rotated anti-clockwise about the origin by 180°.
   A. $(3,-1)$
   B. $(1, 3)$
   C. $(-3,-1)$
   D. $(-1,-3)$

[1314 S.1 2nd Exam MC Q9]

4. Find the area of $ABCD$ in the figure.



   A. 20 sq. units
   B. 22.5 sq. units
   C. 25 sq. units
   D. 16 sq. units

[1314 S.1 2nd Exam SQ Q3]

5. The figure shows a point B on a rectangular coordinate plane.

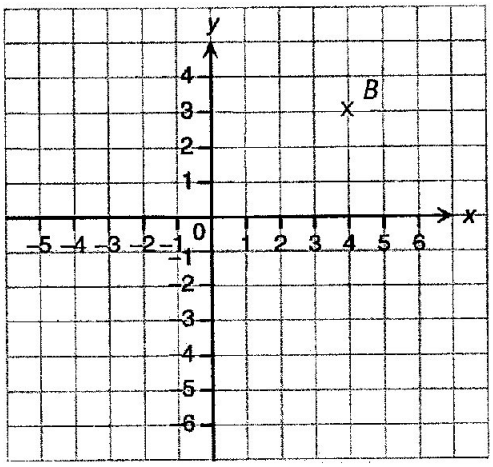
(a) If the coordinates of A are $(-2, 3)$, find the length of AB.

(b) If B is reflected about y-axis, write down the coordinates of its image B'.

(c) If A is rotated anti-clockwise about O through 90°,

(i) mark A and its image A' on the plane, and

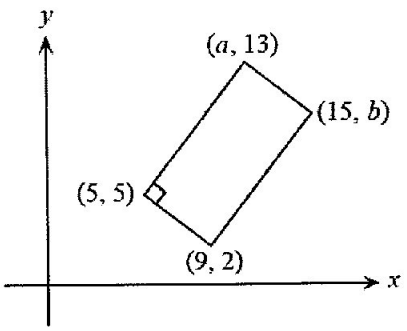
(ii) write down the coordinates of A'.



(4 marks)

[1314 S.1 2nd Exam Bonus Question Q1]

6. In the rectangle shown below, find the value of $a-b$.



(3 marks)

[1516 S.1 2nd Exam MC Q8]

7. In Figure 2, $G(-2, 4)$ is rotated about the origin through 90° in anticlockwise direction to G'. The coordinates of G' are

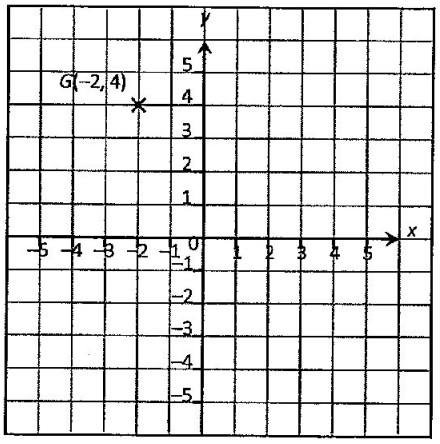


Figure 2

A. $(2, -4)$.

B. $(-4, -2)$.

C. $(4, 2)$.

D. $(4, -2)$.

[1516 S.1 2nd Exam SQ Q6]

8. In Figure 6, line AB is transformed to A_1B_1 and A_1B_1 is then transformed to A_2B_2.

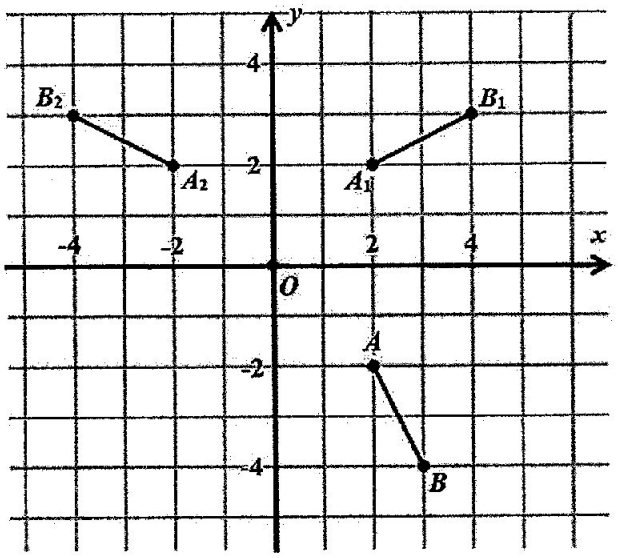


Figure 6

Put a "✓" in the appropriate box (❑) in each step to indicate the correct transformation involved.

(2 marks)

Step 1:

❑ reflected about x-axis

❑ reflected about y-axis

AB is ❑ rotated clockwise about O through 90° to form A_1B_1.

❑ rotated anti-clockwise about O through 90°

❑ rotated clockwise about O through 180°

Step 2:

❑ reflected about x-axis

❑ reflected about y-axis

A_1B_1 is ❑ rotated clockwise about O through 90° to form A_2B_2.

❑ rotated anti-clockwise about O through 90°

❑ rotated clockwise about O through 180°

[1516 S.1 2nd Exam SQ Q7]

9. In Figure 7, find the area of ΔABC.

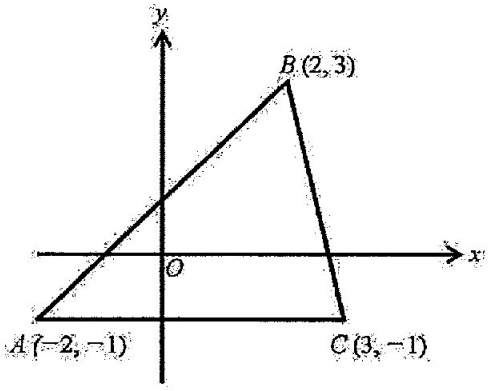


Figure 7

(3 marks)

[1516 S.1 2nd Exam Bonus Question Q1]

10. The vertices of ΔABC are $A(1,-1)$, $B(2b+1,-1)$ and $C(1,\ a+3)$ where a and b are positive numbers. ΔABC is rotated anti-clockwise about the origin through 90° to obtain the image $\Delta A'B'C'$.

The vertices of $\Delta A'B'C'$ are $A'(1,\ 1)$, $B'(1,\ 4b-1)$ and $C'(-2a-1,\ 1)$. Find the values of a and b.

(3 marks)

[1617 S.1 2nd Exam MC Q4]

11. Which of the following pairs of points A and B has a distance of 6 units?

A. $A(2, 3), B(2, 6)$ B. $A(4, -2), B(9, -2)$

C. $A(-5, 1), B(-5, 8)$ D. $A(-1, -7), B(-7, -7)$

[1617 S.1 2nd Exam MC Q9]

12. Which of the following images obtained must have the same x-coordinate as point A?

A. A is translated 4 units to the left.

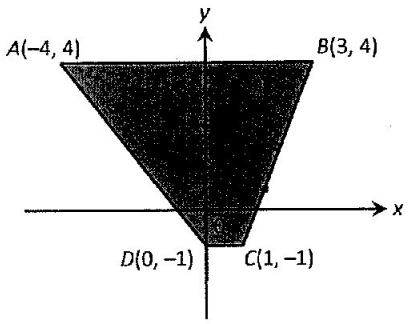
B. A is reflected about the x-axis.

C. A is rotated clockwise about the origin through 90°.

D. A is reflected about the y-axis.

[1617 S.1 2nd Exam SQ Q15]

13. In the figure, find the area of trapezium $ABCD$. (2 marks)



[1617 S.1 2nd Exam Bonus Question Q23]

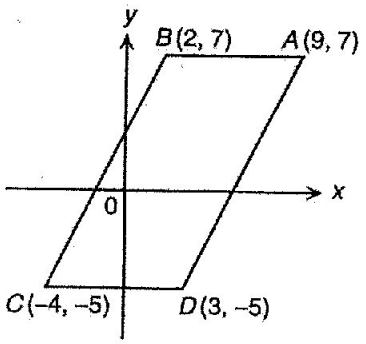
14. The vertices of square $ABCD$ lying in quadrant IV are $A(a+1, -3)$, $B(4, -3)$, $C(4, 2b)$ and $D(a+1, 2b)$ where B is on the right of A and on the top of C. Straight line L is parallel to the y-axis. It is on the left of the y-axis and 1 unit away from it. $ABCD$ is reflected along straight line L to obtain the image $A_1B_1C_1D_1$. It is given that the x-coordinate of A_1 is –3. Find the values of a and b. (3 marks)

[1718 S.1 2nd Exam MC Q9]

15. In which quadrant does the point (–2, –3) lie in?
    A. Quadrant I
    B. Quadrant II
    C. Quadrant III
    D. Quadrant IV

[1718 S.1 2nd Exam FQ Q19]

16. Find the area of the parallelogram *ABCD* in the figure. (3 marks)



[1718 S.1 2nd Exam FQ Q20]

17. Complete the following table. (3 marks)

	Coordinates before transformation	Type of transformation	Coordinates after transformation
(a)	$A(3, -2)$	Translate to the left by 4 units	A'(_____, _____)
(b)	$B(-1, 1)$	Reflect about the x-axis	B' (_____, _____)
(c)	$C(2, 5)$	Rotate clockwise about O through 180°	C' (_____, _____)

[1718 S.1 2nd Exam Bonus Question Q24]

18. In a rectangular coordinate plane, the point $A(-4, 6)$ is rotated anti-clockwise about the origin through 90° to B, and B is then reflected about the y-axis to C. Find the area of ΔABC. (3 marks)

[1819 S.1 2nd Exam MC Q11]

19. Find the distance between the points $A(-5, -1)$ and $B(-5, -7)$.

A. -8 units
B. 2 units
C. 6 units
D. 8 units

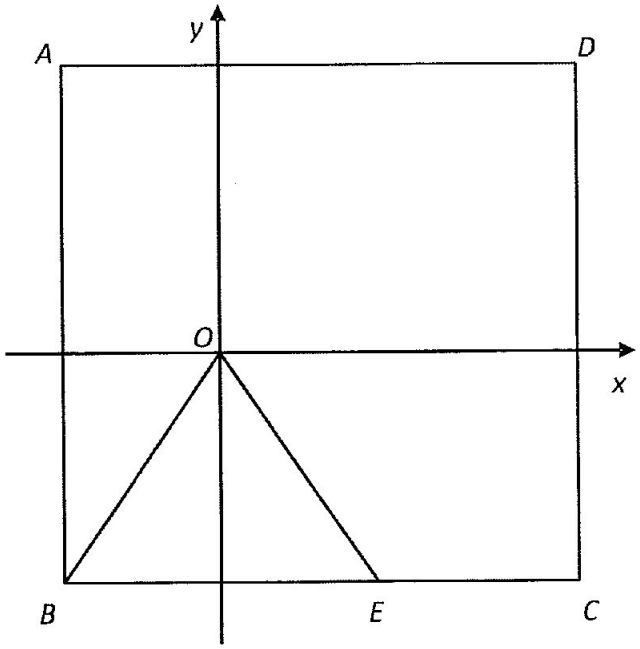
[1819 S.1 2nd Exam MC Q12]

20. The point $A(-2, 1)$ is translated to the right by 3 units and then translated upwards by 2 units to the point A_1. Find the coordinates of A_1.

A. $(1, -1)$
B. $(0, 4)$
C. $(3, 2)$
D. $(1, 3)$

[1819 S.1 2nd Exam IQ Q25]

21. In the figure, O is the origin and $ABCD$ is a square. E is a point lying on BC. The coordinates of A, B and E are $(-3, 5)$, $(-3, -4)$ and $(3, -4)$ respectively.

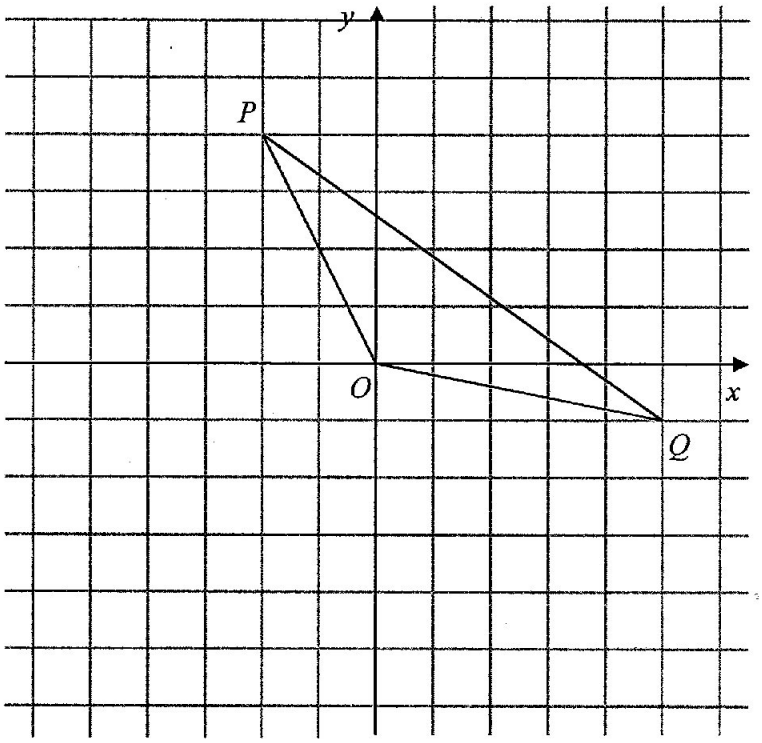


(a) Find the length of the square $ABCD$. (1 mark)

(b) Find the area of the polygon $ABOECD$. (3 marks)

[1819 S.1 2nd Exam IQ Q26]

22. In the figure, O is the origin. The coordinates of the points P and Q are $(-2, 4)$ and $(5, -1)$ respectively. ΔOPQ is reflected about the x-axis to ΔOP_1Q_1, where P_1 and Q_1 are the images of P and Q respectively.

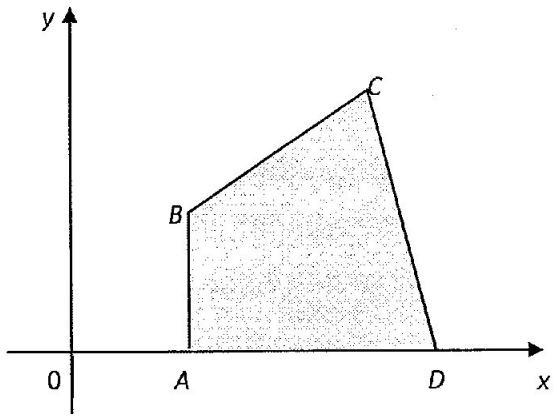


(a) Draw ΔOP_1Q_1 on the rectangular coordinate plane in the figure above. (2 marks)

(b) P_1 is translated 2 units upwards to the point P_2 and Q_1 is rotated clockwise about O through 90° to the point Q_2. Write down the coordinates of P_2 and Q_2. (2 marks)

[1819 S.1 2nd Exam AQ Q28]

23. In the figure, the coordinates of A, B, C and D are (2, 0), (2, 3), (6, 6) and (7, 0) respectively.



(a) Find the area of the quadrilateral $ABCD$. (2 marks)

(b) Amy has to find a point T, other than D, which is lying on the x-axis, such that the area of the quadrilateral $ABCT$ is equal to that of the quadrilateral $ABCD$.

(i) Amy thinks that the point T must be to the left of A. Do you agree? Explain your answer. (1 mark)

(ii) Find the coordinates of the point T. (2 marks)

[1920 S.1 Exam MC Q14]

24. The coordinates of the point P are $(-2, 1)$. If P is translated upwards by 3 units to the point Q, then the coordinates of the reflection image of Q with respect to the x-axis are

A. $(2, 4)$.
B. $(1, -1)$.
C. $(-1, 1)$.
D. $(-2, -4)$.

[1920 S.1 Exam MC Q15]

25. $C(3, 145°)$ and $D(5, 10°)$ are two points on a polar coordinate plane. O is the pole. Find $\angle COD$.

A. 10°
B. 135°
C. 145°
D. 155°

[1920 S.1 Exam IQ Q11]

26. In Figure 4, find the area of quadrilateral $ABCD$. (4 marks)

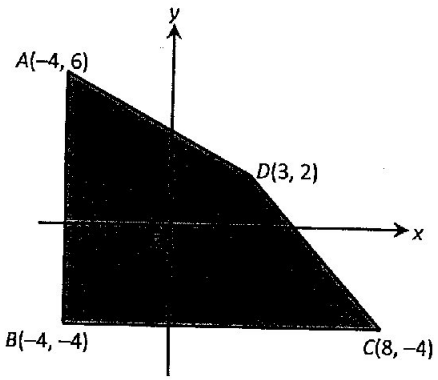


Figure 4

[2021 S.1 Final Exam IQ Q12]

27. The figure shows a rectangular coordinate system with O as origin. The coordinates of A, B and C are $(-5, 4)$, $(-3, -2)$ and $(4, -1)$. C is rotated about O in the anticlockwise direction through 90° to the point D.

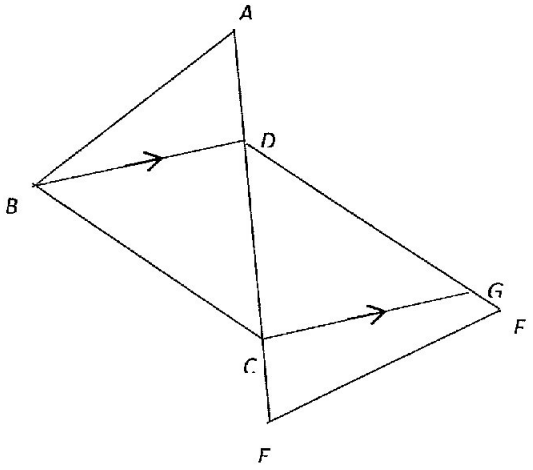
    (a) Write down the coordinates of D.

    (b) Find the area of ΔABD.

(3 marks)

[2021 S.1 Final Exam MC Q14]

28. In the figure, $\Delta ABC \cong \Delta FED$ and $ADCE$ is a straight line. G is a point on DF such that $BD \,//\, CG$.



    (a) Prove that $\Delta BDC \cong \Delta GCD$.

    (b) If $BC = 8$ cm, $AC = 10$ cm and $AB = 7$ cm, find GF.

(4 marks)

[2021 S.1 Final Exam MC Q15]

29. The point $P(5, -6)$ is translated to the left by 3 units to become the point Q. Find the coordinates of Q.

A. $(5, -9)$

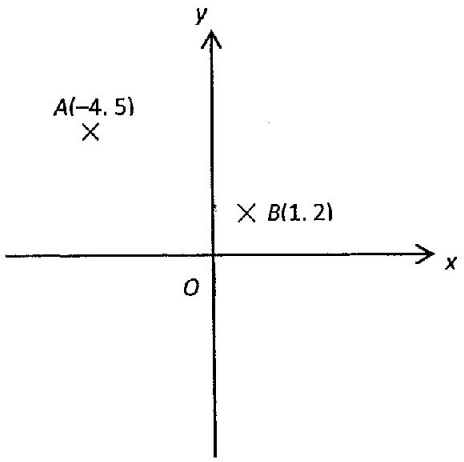
B. $(5, -3)$

C. $(2, -6)$

D. $(8, -6)$

[2021 S.1 Final Exam MC Q16]

30. The figure shows a rectangular coordinate system. The coordinates of A and B are $(-4, 5)$ and $(1, 2)$ respectively. The point A is reflected about a vertical line passing through B to become the point C and then rotated about O through $90°$ in the clockwise direction to become the point D. Find the coordinates of D.



A. $(-1, 4)$

B. $(5, -6)$

C. $(1, -4)$

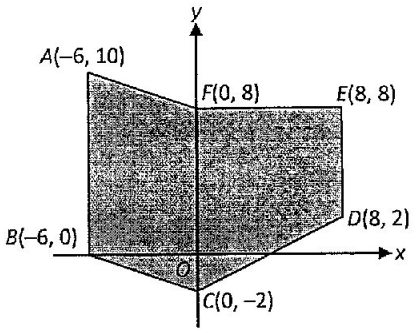
D. $(-5, 6)$

[2122 S.1 Final Exam BQ Q8]

31. The coordinates of two points A and B are $(a, 9)$ and $(-3, 9)$ respectively. It is given that $AB = 15$ units and A is on the right of B, find a. (2 marks)

[2122 S.1 Final Exam IQ Q15]

32. In the figure, find the area of the shaded region. (3 marks)



[2122 S.1 Final Exam MC Q10]

33. The coordinates of point P are $(-9, 12)$. P is reflected with respect to the x-axis to P_1. The coordinates of P_1 are

A. $(-9, -12)$.

B. $(-12, 9)$.

C. $(9, 12)$.

D. $(12, -9)$.

[2122 S.1 Final Exam MC Q11]

34. Which of the following are true?

I. The x-coordinate of the point $(-2, 2)$ is -2.

II. Points from the same horizontal line have the same y-coordinate.

III. The y-axis lies in quadrant II and quadrant III.

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

[2122 S.1 Final Exam MC Q12]

35. The point R is translated downwards by 3 units and then rotated anti-clockwise about the origin through $90°$ to $R_1(2, 8)$. The coordinates of R are

A. $(-1, 8)$.

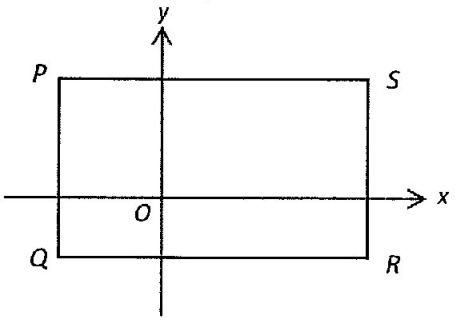
B. $(1, 8)$.

C. $(8, -1)$.

D. $(8, 1)$.

[2223 S.1 Final Exam BQ Q6]

36. The figure shows a rectangle $PQRS$. The coordinates of P and Q are $(-2, 3)$ and $(-2, -1)$ respectively. It is given that $PS = 7$ units.

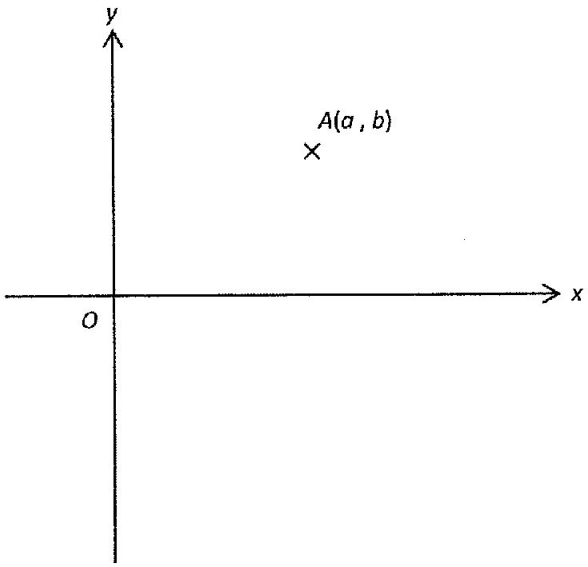


(a) Write down the coordinates of S and R. (1 mark)

(b) Find the perimeter of $PQRS$. (2 marks)

[2223 S.1 Final Exam AQ Q15]

37. In the figure, the coordinates of the point A are (a, b), where $a > b > 0$. Denote the origin by O. A is translated downwards by 14 units and then translated horizontally to C. And then C is rotated anti-clockwise about O through 90° to a point D. It is given that the coordinates of A and D are the same.



(a) (i) Write down the coordinates of C in terms of a and b.

(ii) Express a in terms of b. (2 marks)

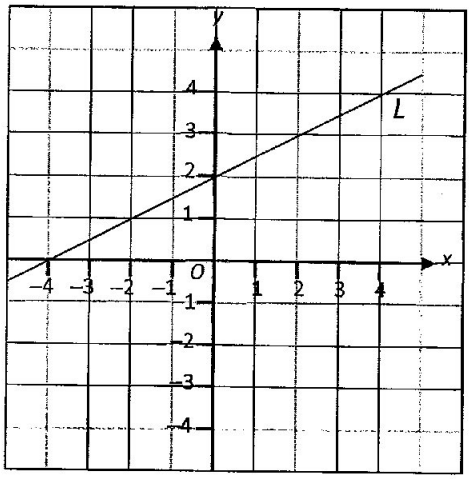
(b) B is a point in quadrant IV such that $OABC$ is a square. It is given that AB cuts the x-axis at P. BC is produced to meet the y-axis at Q. Prove that $\triangle OAP \cong \triangle OCQ$.

(2 marks)

(c) If $OP = 12.5$ units and the area of $OPBC$ is 62.5 square units which is $45\frac{5}{11}\%$ of the area of $OABQ$, find the coordinates of A. (2 marks)

[2223 S.1 Final Exam MC Q8]

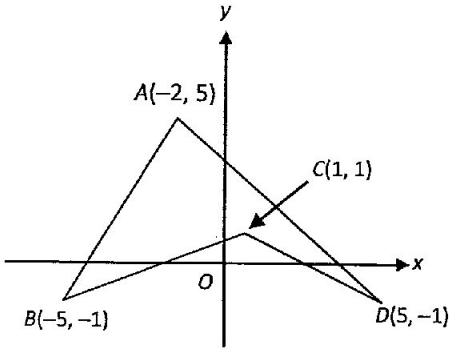
38. In the figure, the straight line L cuts the x-axis at



A. $(-4, 0)$.
B. $(0, -4)$.
C. $(2, 0)$.
D. $(0, 2)$.

[2223 S.1 Final Exam MC Q15]

39. In the figure, find the area of the quadrilateral $ABCD$.



A. 10 square units
B. 20 square units
C. 30 square units
D. 40 square units

[2223 S.1 Final Exam MC Q20]

40. Which of the following statements must be true?

I. $(-2, 3)$ lies in quadrant II.

II. $(5, 4)$ and $(5, -1)$ lie on the same vertical line.

III. The distance between $(2, m)$ and $(2, 7)$ and the distance between $(m - 7, 3)$ and $(0, 3)$ are both $(m - 7)$ units.

A. I and II only

B. I and III only

C. II and III only

D. I, II and III