

1. Find the coordinates of the middle point of the line joining the points (5,-1) and (1, 4).
2. Find the coordinates of the point which divides the join of the points (8, 9) and (-7, 4), internally in the ratio 2:3.
3. Find the ratio in which a given the point (2, 1) divides the join of the points (1, 2) and (4,7).
4. Find the ratio in which the axes divide the line joining the points (-2,5) and (1, 9).
5. Find the centroid of the triangle whose angular points are (3, -5),(-7, 4) and (10, -2) respectively.
6. Find the point of trisection of the line segment joining the points (1,2) and (11,9).
7. Determine the ratio in which the point P(m,6) divides the join of A(-4, 3) and B (2, 8). Also find the value of m.
8. The mid-point of the line segment joining (2a, 4) and (-2, 3b) is (1, 2a+1). Find the value of a and b.
9. Find the reflection of the point A(7, -4) in the point p (3, -1).
10. If the points A(a, -11), B(5, b),C(2, 15) and D(1,1) are the vertices of a parallelogram ABCD, find the value of a and b.
11. The coordinates of the mid-points of sides of a triangle are (1, 2),(0, -1) and (2, -1). Find its centroid.
12. In the adjoining figure , P and Q have coordinates (4, 6) and (0, 3) respectively. Find .
13. Find the value of x so that the line passing through the points (1, 4) and (x, 6) makes an angle of 45° with the positive direction of the x- axis.
14. State which of the following lines are parallel or perpendicular or neither:
 - a. Through (2, -3) and (4, -1); through (-6,3) and (-4, 5)
 - b. Through (1, -5) and (5, -3); through (2, 5) and (4, 1)
15. Show that the point (6, 4),(8, 6) and (5, 3) are collinear.
16. State the equation of the line which has the y-intercept equal to $\frac{4}{3}$ and is perpendicular to $3x-4y+11=0$.
17. Find the equation of the straight line through the given point P(-1, -5) and having its slope equal to $\frac{9}{5}$.
18. Find the equation of the straight line joining the points A(5, 7) and B(-1, 2).
19. Given that (a, 2a) lies on the line $\frac{y}{2}=3x - 6$, find the value of a.
20. Find the equation to the straight line passing through the point (3, -4) and cutting off intercepts, equal but of opposite signs, from the two axes.

21. A (2, -4), B (3, 3) and C (-1, 5) are the vertices of triangle ABC. Find the equation of:
- The median of the triangle through A; the length of AD
 - The altitude of triangle through B.
22. (-2, -1) and (4, -5) are the coordinates of vertices B and D respectively of a rhombus ABCD. Find the equation of the diagonal AC.
23. Write down the equation of the line whose gradients is $\frac{3}{4}$ and which passes through P, where P divides the line segment joining A(2, -5) and B(-5, 9) in the ratio 3:4.
24. The figure alongside represents lines $y=x+1$ and $y=\sqrt{3}x-1$. Write down the angles that the line make with the positive direction of x-axis. Hence determine the angle θ .

1. The triangle $A(1, 2)$ $B(4, 4)$ and $C(3, 7)$ is first reflected in the line $y = 0$ onto triangle $A'B'C'$ and then triangle $A'B'C'$ is reflected in the origin onto triangle $A''B''C''$. Write down the co-ordinates of:
 - i. A' , B' and C'
 - ii. A'' , B'' and C''
2. A point P is reflected in the x -axis. Co-ordinates of its image are $(8, -6)$.
 - i. Find the co-ordinates of P .
 - ii. Find the co-ordinates of the image of P under reflection in the y -axis.
3. Points $(-5, 0)$ and $(4, 0)$ are invariant points under reflection in the line L_1 ; Points $(0, -6)$ and $(0, 5)$ are invariant on reflection in the line L_2 .
 - a. Name or write equations for the lines L_1 and L_2 .
 - b. Write down the images of $P(2, 6)$ and $Q(-8, -3)$ on reflection in L_1 . Name the images as P' and Q' respectively.
 - c. Write down the images of P and Q on reflection in L_2 . Name the images as P'' and Q'' respectively.
 - d. State or describe a single transformation that maps Q' on to Q''
4. Find the reflection of the point $P(-1, 3)$ in the line $x = 2$
5. Find the reflection of the point $Q(2, 1)$ in the line $y + 3 = 0$
6. The points $P(5, 1)$ and $Q(-2, -2)$ are reflected in line $x = 2$. Use graph paper to find the images P' and Q' of points P and Q respectively in line $x = 2$. Take 2 cm equal to 2 units.
7. Use the graph paper for this question. (Take two divisions = 1 unit on both the axes) Plot the points $P(3, 2)$ and $Q(-3, -2)$. From P and Q , draw perpendiculars PM and QN on the x -axis.
 - a. Write the co-ordinates of points M and N .
 - b. Name the image of P on reflection in the origin.
 - c. Assign the special name to geometrical figure $PMQN$ and find its area.
 - d. Write the co-ordinates of the point to which M is mapped on reflection in
 - i. x -axis,
 - ii. y -axis
 - iii. origin.
8. Use graph paper for this question.
The points $A(2, 3)$, $B(4, 5)$ and $C(7, 2)$ are the vertices of ΔABC .

- i. Write down the co-ordinates of A' , B' , C' if $\Delta A' B' C'$ is the image of ΔABC . When reflected in the origin.
- ii. Write down the co-ordinates of A'' , B'' , C'' if $\Delta A'' B'' C''$ is the image of ΔABC . When reflected in the x-axis.
- iii. Mention the special name of the quadrilateral $BCC''B''$ and find its area.

