

Median (Geometry)

In a triangle, a median is a line joining a **vertex** to the midpoint of the opposite side. It divides the triangle into two parts of equal area. The three medians intersect in the triangle's **centroid** or center of mass, and two-thirds of the length of each median is between the vertex and the centroid, while one-third is between the centroid and the midpoint of the opposite side.

1. Find the equation of the median line from vertex A in ΔABC , if the coordinates of the vertices are A(-3, -1), B(3, 5), and C(7, -3).
2. Find the equation of the perpendicular bisector of the line segment joining P(-1, 4) to Q(3, -2).
3. Find the midpoint of each diagonal of the quadrilateral with vertices P(1, 3), Q(6, 5), R(8, 0), and S(3, -2). Based on your results, what type of quadrilateral do you think PQRS is?
4. The points P(5, -3), Q(-2, 4), R(-1, 7), and S are the vertices of a parallelogram PQRS. Find
 - (a) The coordinates of the midpoint of diagonal PR
 - (b) The coordinates of S
5. Find the lengths of the median of the triangle with vertices at A(2, -2), B(-4, -4), and C(0, 4).
6. Find the equation of the medians of the triangle with vertex coordinates J(2, 5), K(4, -1), and L(-2, -5)
7. Find the lengths of the midsegments of ΔABC with vertex coordinates A(-2, 10), B(-9, 2), and C(3, -3).
8. Is ΔPQR , with vertices P(2, 1), Q(-1, -3), and R(6, -2), an isosceles, equilateral, scalene, or right triangle?
9. A triangle has vertices P(7, 7), Q(-3, -5), and R(5, -3).
 - (a) Find the coordinates of the midpoints of the three sides of ΔPQR .
 - (b) Calculate the slope of the midsegments of the ΔPQR .
 - (c) Calculate the slope of the three sides of ΔPQR .
 - (d) Compare your answers in (b) and (c). What do you notice?
10. On a design plan, the vertices of a thin triangular component are A(-2, 4), B(6, 2), and C(-4, -2). Find the centre of mass.
 - (a) Find the midpoints of two sides.
 - (b) Find the equation of the lines containing the medians.
 - (c) Find the point of intersection of these lines.
 - (d) What other name does this point have?
 - (e) Is there another way to find the centre of mass?

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