

In-Class Assignment

You and the other members of your group will be assigned one question from this page and the corresponding question from the back of the page. As a group, you will be given 20 minutes to discuss your questions. After the 20 minutes, you must **each** complete **both** of your assigned questions **individually**. You may **NOT** use your books at any time during this assignment to help you.

Verifying Geometric Properties

1. A triangle has vertices $P(-2, 7)$, $Q(-4, 2)$ and $R(6, -2)$. Prove that PQR is a right triangle. Prove that the midpoint of the hypotenuse is the same distance from each vertex.
2. A quadrilateral has vertices $A(-3, 2)$, $B(1, 7)$, $C(5, 1)$ and $D(-1, -1)$. Verify for a pair of adjacent sides that the line segment joining their midpoints is parallel to a diagonal of the quadrilateral.
3. Given quadrilateral $PQRS$ with vertices $P(0, 7)$, $Q(-2, 1)$, $R(4, -1)$ and $S(6, 3)$, determine the midpoint of each side. Join the midpoints to form a new quadrilateral $TUVW$. Verify that opposite sides of $TUVW$ are parallel.
4. A quadrilateral has vertices $A(3, 3)$, $B(3, -3)$, $C(-3, 3)$ and $D(-3, -3)$. Verify that the diagonals of the quadrilateral are right bisectors of each other.
5. A quadrilateral has vertices $P(7, 9)$, $Q(2, 8)$, $R(1, 0)$ and $S(8, 4)$. Verify that the diagonals are perpendicular. Verify that diagonal QS does not bisect PR .
6. Points $A(2, 5)$, $B(8, -1)$, $C(5, -4)$ and $D(-1, 2)$ are the vertices of a rectangle. Join the midpoints of the rectangle to form a rhombus. Verify that the two diagonals of the rhombus are perpendicular.
7. A quadrilateral has vertices $K(-1, 4)$, $L(2, 2)$, $M(0, -1)$, and $N(-3, 1)$. Verify that the diagonals of the quadrilateral are equal in length and are perpendicular to one another.
8. Given $\triangle ABC$ with vertices $A(-7, 3)$, $B(-2, -3)$, and $C(4, 2)$, classify the triangle by side length.

Equations of Medians, Altitudes and Right Bisectors

1. Triangle DEF has vertices $D(2, 8)$, $E(6, 2)$ and $F(-3, 2)$. Determine the point of intersection of two of the altitudes.
2. Triangle ABC has vertices $A(-2, 5)$, $B(5, 1)$ and $C(-4, -5)$. Determine the point of intersection of two of the medians
3. Triangle PQR has vertices $P(-12, 6)$, $Q(4, 0)$ and $R(-8, -6)$. Determine the point of intersection of two of the medians
4. Triangle LMN has vertices $L(-6, 9)$, $M(6, 1)$ and $N(-6, -7)$. Determine the point of intersection of two of the medians
5. Triangle JKL has vertices $J(-2, 0)$, $K(2, 8)$ and $L(7, 3)$. Determine the point of intersection of two of the right bisectors.
6. Triangle STU has vertices $S(-2, 5)$, $T(5, -2)$ and $U(-8, -7)$. Determine the point of intersection of two of the right bisectors.
7. Triangle ABC has vertices $A(-1, 4)$, $B(-1, -2)$ and $C(5, 1)$. Determine the point of intersection of two of the altitudes.
8. Triangle WXY has vertices $W(1, 9)$, $X(-3, 2)$ and $Y(7, 0)$. Determine the point of intersection of two of the right bisectors.