

Show all your work on a separate piece of paper.

- 1) Use the distance formula to show that the triangle with vertices $A(-3, 4)$, $M(3, 1)$, and $Y(0, -2)$ is isosceles.
- 2) Quadrilateral TAUL has vertices $T(4, 6)$, $A(6, -4)$, $U(-4, -2)$ and $L(-2, 4)$. Use the distance formula to show that the diagonals are congruent.
- 3) Triangles JAN and RFK have vertices $J(-2, -2)$, $A(4, -2)$, $N(2, 2)$, $R(8, 1)$, $F(8, 4)$, and $K(6, 3)$. Use the distance formula to show that the triangles are similar.
- 4) Use the midpoint formula to prove that the quadrilateral RAYJ is a parallelogram by showing that the diagonals bisect each other. The vertices are at the following points $R(-1, -6)$, $A(1, -3)$, $Y(11, 1)$, and $J(9, -2)$.
- 5) Given triangle JMK where $J(-6, -2)$, $M(3, 1)$, and $K(-3, 4)$ use the distance formula and Pythagorean theorem to prove that it is a right triangle.

What other characteristic does this triangle have in reference to its side lengths?
- 6) Given the points $A(-6, -4)$, $B(4, 2)$, $C(6, 8)$, and $D(-4, 2)$ use the distance formula to show that ABCD is a parallelogram by proving that both pairs of opposite sides are congruent.
- 7) Given points $E(-4, 1)$, $F(2, 3)$, $G(4, 9)$, and $H(-2, 7)$ prove that EFGH is a rhombus.
- 8) Given points $R(-4, 5)$, $S(-1, 9)$, $T(7, 3)$, and $U(4, -1)$ use the lengths of the diagonals to prove that the quadrilateral is a rectangle.
- 9) Given points $N(-1, -5)$, $O(0, 0)$, $P(3, 2)$, and $Q(8, 1)$ prove that the quadrilateral is an isosceles trapezoid.

Find the midpoints of the legs.

Find the length of the median of the trapezoid.

- 10) Find the coordinate of the fourth vertex of a rectangle that has three vertices at $(-3, -2)$, $(2, -2)$, and $(2, 5)$