

### Preview

You will prove that the diagonals of the rectangle with vertices  $A(-5,-1)$ ,  $B(-5,4)$ ,  $C(7,4)$  and  $D(7,-1)$  are equal in length and bisect each other by following the steps below:

a) Draw a rough sketch of the rectangle in your notebook and label all the information you have on the sketch.

b) To prove (or show) that the diagonals are equal in length use the formula for the distance between any two points to determine the lengths of each of the diagonals, then write a concluding statement about the results of your calculations.

c) To prove (or show) that the diagonals of ABCD bisect each other you have two choices:

1. Find the point of intersection of the vertices and use the distance formula to show that each half of each diagonal is the same length as the other half.

OR

2. Prove or show that the midpoints of both diagonals are, in fact, the same point.

Do #2, it's easier.

## **U3L7 – 2.11 Verifying Geometric Properties**

Students will use all that they know about using coordinates to find lengths and slopes of line segments as well as equations of lines to verify properties of geometric figures.

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### **Examples**

1. Show that the midsegments of the quadrilateral with vertices at  $P(-2,-2)$ ,  $Q(0,4)$ ,  $R(6,3)$ , and  $S(8,-1)$  form a parallelogram.

2. a) Show that points A(-4,3) and B(3,-4) lie on the circle with equation  $x^2+y^2=25$ .
- b) Show that the perpendicular bisector of chord AB passes through the centre of the circle.

Ex.Pg. 203 – 204 #4 (hint: you have to show that the equation of the line through (-5,4) that is perpendicular to the line through (1,8) and (-1,-2) goes through the midpoint of line segment with endpoints (1,8) and (-1,-2).

#6,10,11,12

Challenge Question #14