

# INVESTIGATION 2: DIAGONALS AND MIDPOINTS OF QUADRILATERALS

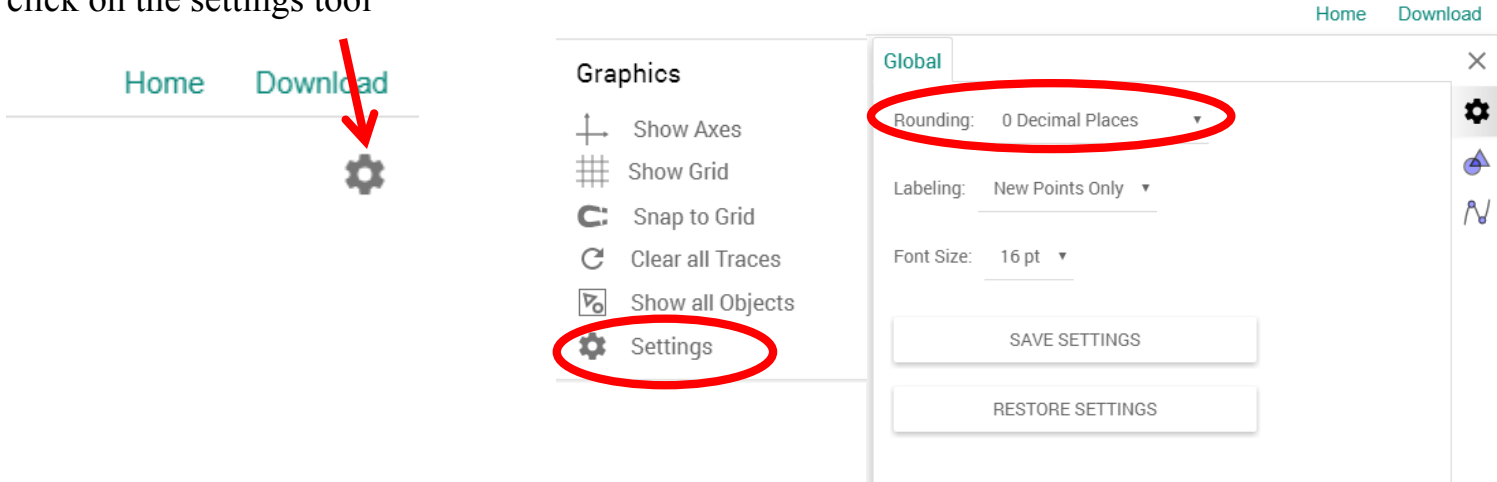
## SET UP

Go to Geogebra.org

Select Geogebra Geometry



Change the setting so that values are rounded to 0 decimal places. From the right hand side click on the settings tool





## TASK 3

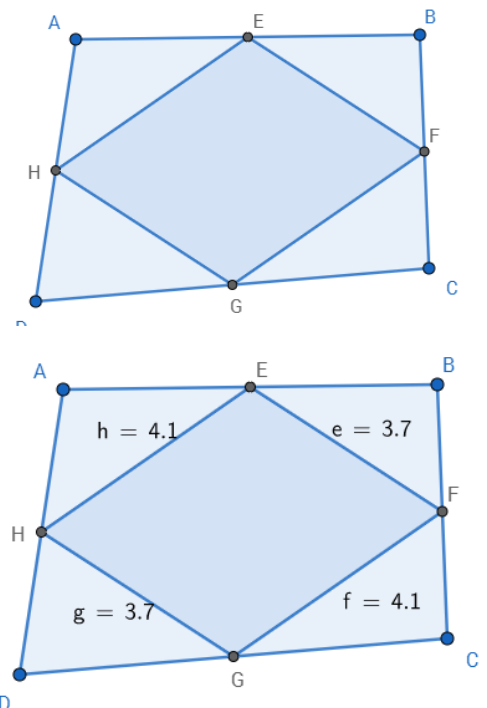
Use the  to construct quadrilateral ABCD.

Remember to click somewhere for A, then B, C and D, then click A again to complete the quadrilateral.

Recall you can remove or change labels by using the label tool under the Edit menu.

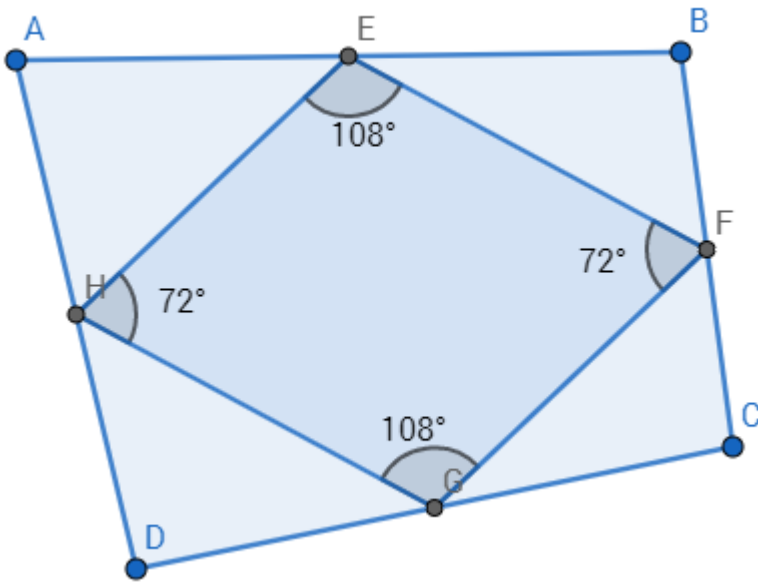
Then use the  icon and select “midpoint or center” to construct the midpoint of each side of the quadrilateral. Then using the polygon tool, construct a quadrilateral that joins the four midpoints EFGH.

Use the  tool to measure each side length of EFGH. Click on each segment to get the length of each.





Use the  measure tool to measure the interior angles of EFGH. (remember you can click the interior of the shape to get all 4 angles)




**Conclusion 3**

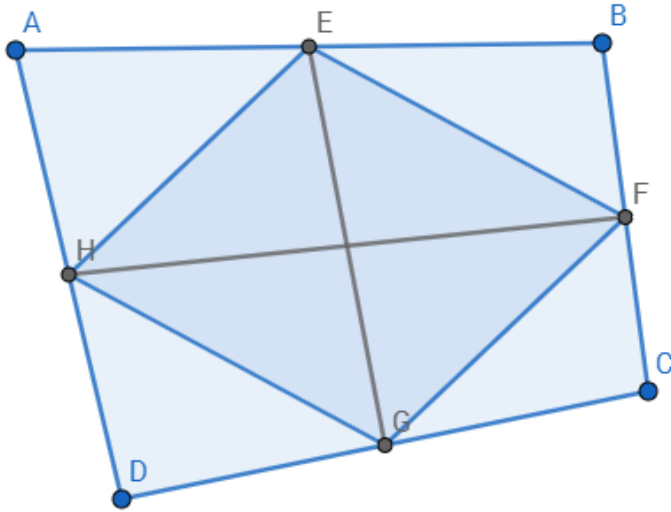
Complete the conclusion on the handout

Keep your drawing from Task 3 to complete Task 4.  
You may delete the angle measures.


## TASK 4

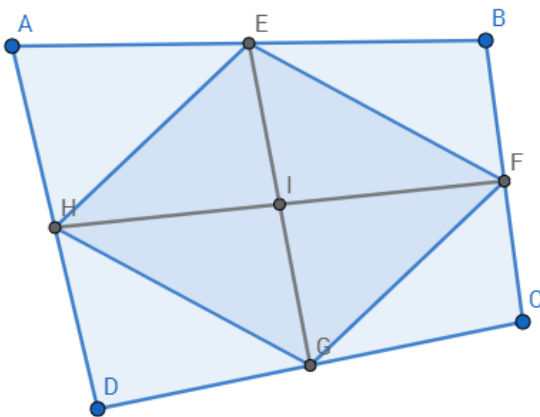



Under the Basic tools select  icon on the toolbar. Construct the diagonals of EFGH, by selecting point E and G, then connecting point F and H with another line segment.

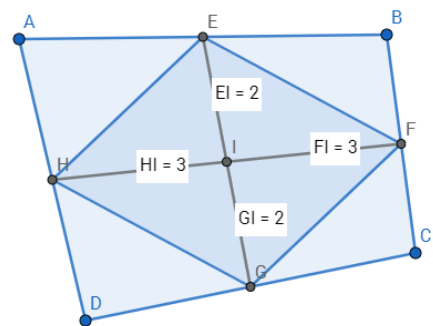


Use the intersection (at the bottom of the tools menu click on MORE, then go to the points

menu) tool  to construct a point at the intersection of the two diagonals



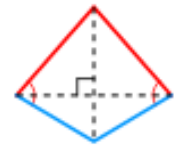
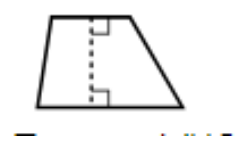
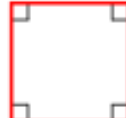
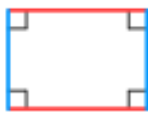
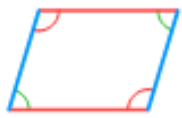
Use the “Distance or Length” option  to measure the distance from each of E,F,G, and H to the point in the middle (I). (i.e. length of EI, FI, GI and HI).



### Conclusion 4

Complete the conclusions on your handout

## TASK 5 – On handout



\_\_\_\_\_

Name the quadrilaterals above.

Using the diagrams (and geogebra if needed) explore the answers to the following questions:

- Which of the quadrilaterals above would have diagonals that bisect each other?

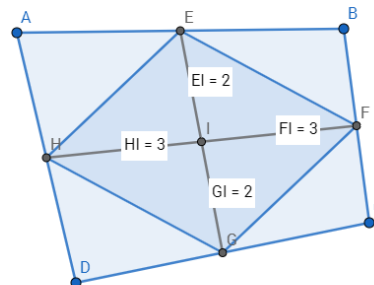
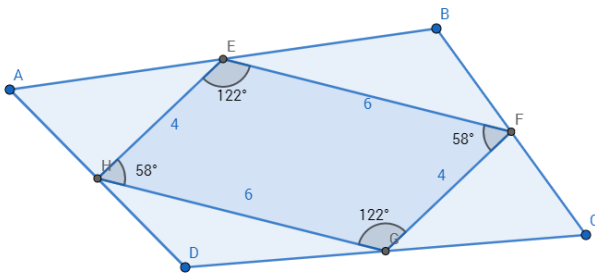
- Which of the quadrilaterals above would have diagonals that are perpendicular?

- Therefore, which quadrilaterals would have diagonals that are considered perpendicular bisectors (both bisect each other and intersect at  $90^\circ$  angles)?

## SUMMARY:

1. Joining the midpoints of the sides of any quadrilateral produces a

\_\_\_\_\_.



2. The diagonals of a parallelogram \_\_\_\_\_ each other.