
Midpoint Investigation

Teacher Notes

Introduction

The aim of this activity is to allow students to investigate the relationship between the coordinates of the endpoints and the coordinates of the midpoint of a line segment. Students are encouraged to 'spot the rule', which they can then self-check their answer.

This activity can be easily differentiated. The teacher can direct students to investigate coordinates in only the first quadrant (leading to positive values only) or to investigate coordinates in all four quadrants (leading to positive and negative values). Further, the teacher can choose whether or not they want the students to work with a partially constructed activity or a fully constructed activity.

Resources

Students will need a copy of the TI-Nspire document entitled Midpoint Investigation v1KB transferred onto their handhelds.

There is also a student worksheet entitled Midpoint Investigation Worksheet, a copy of which is required for each student.

Length of time required (approx)

This is quite a short activity, requiring only about half-an-hour. The time for the activity could be shortened by using pages 3.1 and 3.2 (which have the midpoint pre-constructed) instead of pages 2.1 and 2.2.

Skills required


To undertake this activity, students will need to be able to:


- open a TI-Nspire document and move between the pages of the document;
- move the cursor around the screen;
- grab and move a point.



The activity

The TI-Nspire document Midpoint Investigation v1KB contains 3 problems, each of two pages in length. Problem 1, containing pages 1.1 and 1.2, provides information and directions for the activity. Problem 2 and Problem 3 are very similar; the only difference is that the midpoint of the line segment has been preconstructed in Problem 3. It is entirely at the teacher’s discretion whether they chose to work with Problem 2 or Problem 3. The activity in pages 2.1 and 3.1 is based in just the first quadrant; the activity in pages 2.2 and 3.2 is based in all four quadrants.

If the teacher decides to work with the activities in Problem 2, the students will need to construct a mid-point for the line segments in each of pages 2.1 and 2.2. To do this:

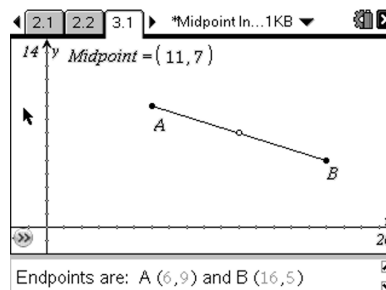
- press 
- select A: Construction
- select 5: Midpoint

Now move the cursor over the line segment, click on the line segment, move the cursor away (you should now see the midpoint marked on the line segment) and press .

To display the coordinates of the midpoint, move the cursor over the midpoint, press   and then choose 7: Coordinates and Equations.

Assuming now that the midpoint has been constructed and displayed, or that the teacher has chosen to do the activity from Problem 3, students simply grab and move the endpoints of the line segment in page 2.1 or page 3.1. The coordinates of the endpoints are updated and displayed below the main window; the coordinates of the midpoint are updated and displayed in the main window.

Students are encouraged to note the coordinates of the endpoints and the midpoint onto their worksheet and to repeat the exercise several times. This will provide them with evidence from which they can make a conjecture about the relationship between the coordinates of the endpoints and the coordinates of the midpoint of a line segment.



As an extension to the first task, pupils can investigate the relationship across all four quadrants from pages 2.2 or 3.2.

