

Distances in the Coordinate Plane

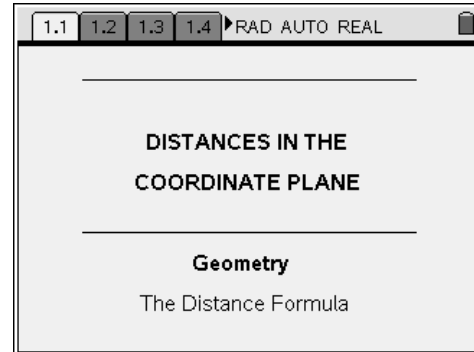
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Name _____

Class _____

In this activity, you will explore:

- *finding the length of a segment using the Distance Formula*
- *finding the length of a segment using the Pythagorean Theorem.*



Open the file *GeoAct30_Distance_EN.tns* on your handheld and follow along with your teacher to work through the activity. Use this document as a reference and to record your answers.

Problem 1 – The Distance Formula

On page 1.3, construct a segment. Find the coordinates of the endpoints and measure its length. Then use the Distance Formula to calculate its length.

Endpoints	Measured Length	Calculated Length
(____, ____) and (____, ____)	_____	_____
(____, ____) and (____, ____)	_____	_____

What is important to remember when using the Distance Formula?

What happens to the Distance Formula when your segment is horizontal or vertical? Give an example using endpoints.

(____, ____) and (____, ____)

Problem 2 – The Distance Formula and the Pythagorean Theorem

On page 2.2, measure the lengths of all three sides of your triangle. Which side is the longest? Can two of the sides be equal lengths? Which two?

Use the Pythagorean Theorem to calculate the length of your segment in another way.

Endpoints	Measured Length	Pythagorean Length
(____, ____) and (____, ____)	_____	_____
(____, ____) and (____, ____)	_____	_____

What is the relationship between the Pythagorean Theorem and the Distance Formula?

Apply The Math

What formula gives the distance between the points (x_1, y_1) and (x_2, y_2) ?

Determine the length of the segment with the following endpoints:

1. $(1, 2)$ and $(5, 10)$
2. $(5, 8)$ and $(9, 5)$
3. $(7, 4)$ and $(4, 7)$
4. $(-2, 3)$ and $(3, 5)$
5. $(1, -9)$ and $(-2, -7)$
6. $(3, 5)$ and $(3, -11)$

Given an endpoint and a length of a segment, find a possible other endpoint:

7. Endpoint: $(3, 1)$; Length 5