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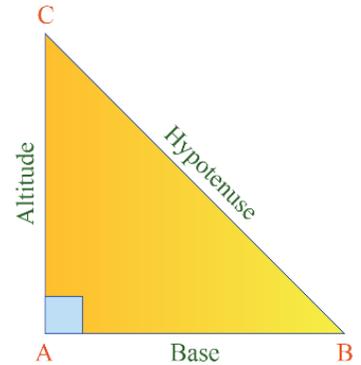
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Pythagorean Theorem and Distance Formula Worksheet

Objective: You will learn how to come up with the distance formula that you can use for any two points on xy-coordinate.

Warm-Up

1. What is the Pythagorean Theorem? What can we solve using it?
2. How do I plot coordinates on a grid/graph?



Activity #1 (use the coordinate grid)

1. Jin is located at coordinate $(-1, -3)$ and Kariana lives at $(4, 2)$ on the xy-plane. This is the same plane where the cool mathematicians live at coordinate $(4, 3)$ and are having a party. **Plot the coordinate points on the graphing sheet.**
 - a. How many units does Kariana need to drive to get to the cool math party? In what direction?
 - b. How many units does Jin need to drive to get to the cool math party? In what direction?
 - c. How did you know? Write your explanation in full sentences. **Discuss with your partner and be prepared to share.**

Activity #2 (using the same graph)

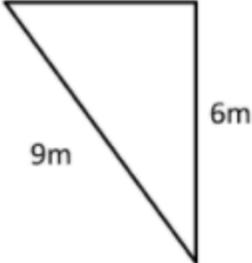
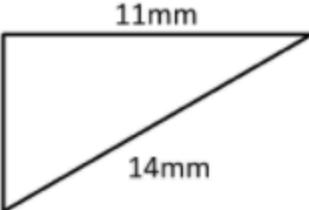
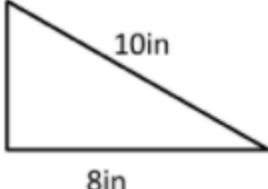
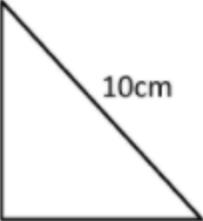
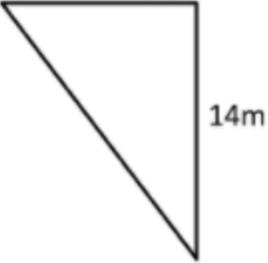
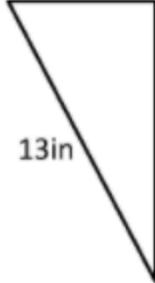
2. Jin is super anti-social, so he doesn't want to go to the party. Instead, he wants to hang out with Kariana at Kariana's house. What would be the fastest path for Jin?
 - a. Draw the path directly onto the graph. **Compare with your group.**

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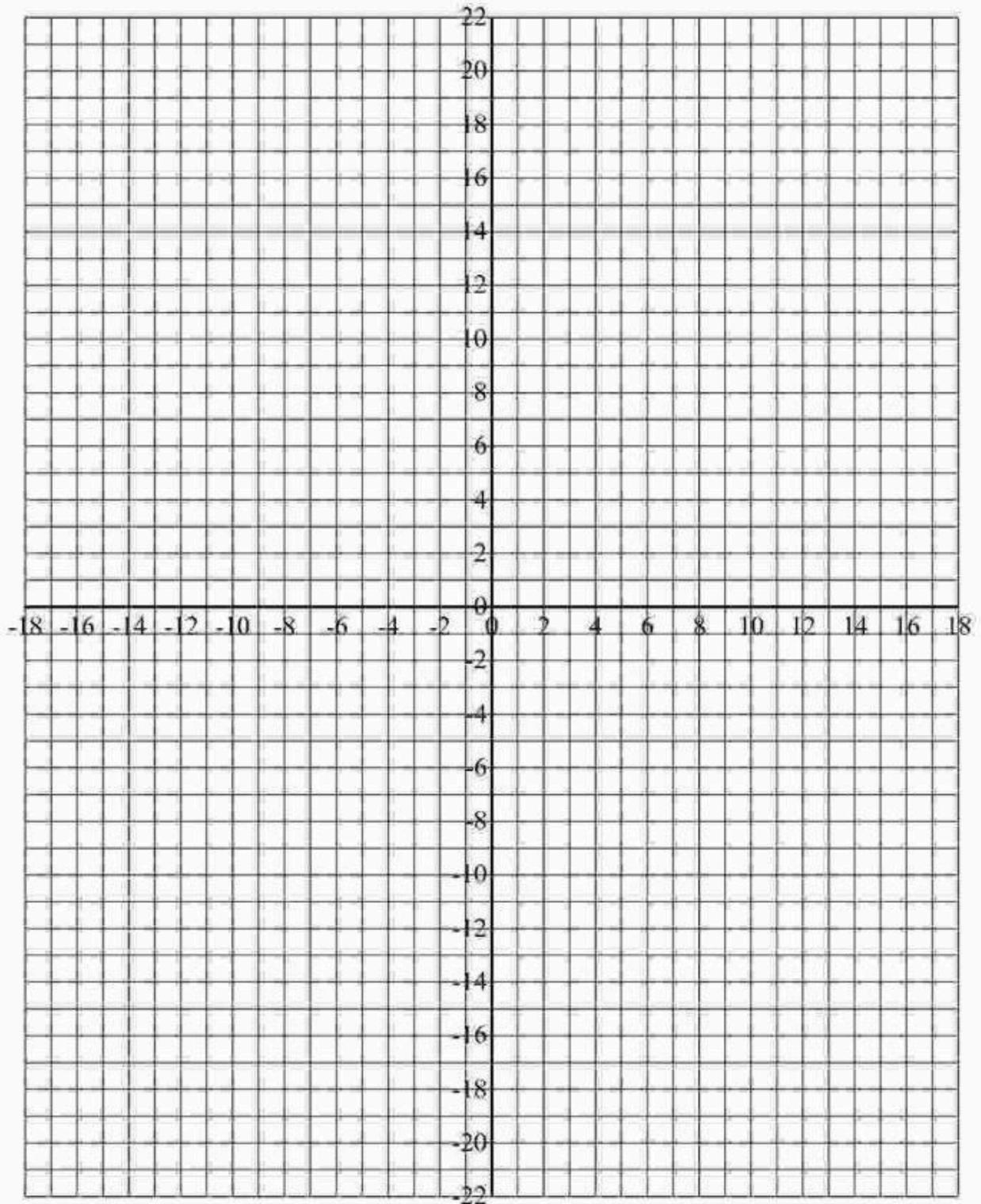
- b. How can you measure the distance between Jin and Kariana? **Discuss with your partner and be prepared to share.**
3. Connect the lines to create a _____ triangle. What can we use to solve for the length of the hypotenuse?
- Label CMP to Jin as A . How many units is it?
 - Label Kariana to CMP as B . How many units is it?
 - Label Jin to Kariana as C . The distance of C is...

Pythagorean Theorem Practice

 <p>A right-angled triangle with a vertical leg of 6m and a horizontal leg of 9m. The hypotenuse is the diagonal side.</p>	 <p>A right-angled triangle with a horizontal leg of 11mm and a vertical leg of 14mm. The hypotenuse is the diagonal side.</p>	 <p>A right-angled triangle with a horizontal leg of 8in and a vertical leg of 10in. The hypotenuse is the diagonal side.</p>
 <p>A right-angled triangle with a vertical leg of 7cm and a horizontal leg of 10cm. The hypotenuse is the diagonal side.</p>	 <p>A right-angled triangle with a horizontal leg of 12m and a vertical leg of 14m. The hypotenuse is the diagonal side.</p>	 <p>A right-angled triangle with a horizontal leg of 6in and a vertical leg of 13in. The hypotenuse is the diagonal side.</p>

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Activity #3

We found the distance between the two points.

Let's use generic numbers. **Label these coordinates.**

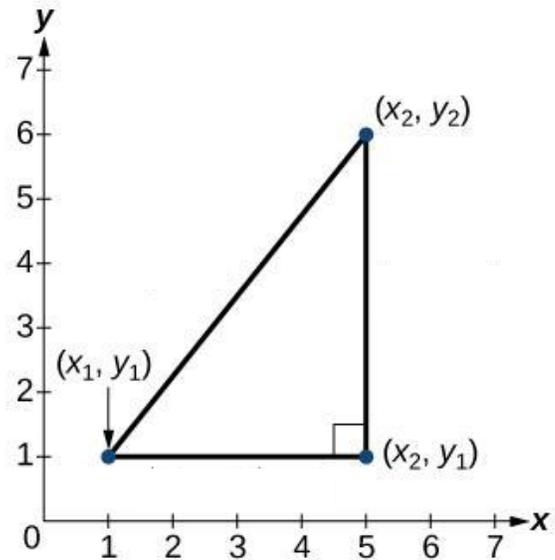
Point 1 (L): (x_1, y_1)

Point 2 (M): (x_2, y_2)

Point 3 (N): (x_2, y_1)

Using these points:

- What's the distance/length of LN?
- What's the distance/length of MN?



3. Using the Pythagorean Theorem, find the length of the hypotenuse (LM). **Show your work!**

4. Can I use this strategy for all distances on x-y coordinate planes? Explain the strategy in your own words.

Distance Formula & Practice

The distance between 2 points (x_1, y_1) and (x_2, y_2) is given by the formula:

_____.

1. Find the distance between the two points A $(-4, -1)$ and B $(1, 2)$

2. Find the distance between the two points T $(2, 7)$ and H $(-2, -1)$.