



MATH WITH MR DJ

GRADE 6 · THE NUMBER SYSTEM

# DISTANCE ON THE COORDINATE PLANE

**Today's goal:** I can use coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.



Tan



Digit



Blaze



Pi



# How far from $(-4, 1)$ to $(6, 1)$ ?

- 1 Both have  $y = 1$ , so they sit on the same horizontal line.

## TURN & TALK

is it 2 units or 10 units?



# Subtract what DIFFERS, then take ||

- 1 Same  $x \rightarrow$  the points are vertical; subtract the  $y$ -values.
- 2 Same  $y \rightarrow$  the points are horizontal; subtract the  $x$ -values.
- 3 Absolute value keeps the answer positive.



## BIG IDEA 2

$$|6 - (-4)| = |10| = 10 \text{ units}$$

- 1 Subtracting a negative adds.
- 2 Count it:  $-4$  to  $0$  is  $4$ , then  $0$  to  $6$  is  $6 \rightarrow 10$  total.

### REMEMBER

**Crossing zero? The two parts add.**



### BIG IDEA 3

## But watch the same-side case

1  $(-7, 5)$  to  $(-2, 5)$ : both are LEFT of zero.

2  $|-2 - (-7)| = 5$  units — not 9.

#### REMEMBER

**Same side** → **subtract**. **Opposite sides** → **the parts add**.



WATCH OUT!

# Order never matters

1  $|9 - 2| = 7$  and  $|2 - 9| = |-7| = 7$

2 Distance says HOW FAR, never which direction.

DON'T FALL FOR IT

**A distance is never negative.**



**SPOT THE SLIP!**

**Turn & talk**

# Something went wrong here...

## THE PROBLEM

Find the distance between  $(-3, 7)$  and  $(4, 7)$ .

## WHAT A STUDENT DID

Answered 1 — treated  $-3$  as 3 and subtracted.

## YOUR MISSION

**What went wrong? What's the right answer?**



Find the distance between  $(-3, 7)$  and  $(4, 7)$ .

$$1 \quad |4 - (-3)| = |4 + 3| = 7.$$

Answer: **7 units**



# Pick your pepper!



MILD

Find the distance between  $(1, 4)$  and  $(1, 9)$ .

#1 on your practice sheet



MEDIUM

Find the distance between  $(-8, 0)$  and  $(-1, 0)$ .

#3 on your practice sheet



SPICY

Find the distance from  $(2, 5)$  to  $(9, 5)$ , then from  $(9, 5)$  to  $(2, 5)$ . Explain why both give the same answer.

#6 on your practice sheet

# How's it going?



**3 • Got it!**

I could teach it



**2 • Almost**

One more example, please



**1 • Not yet**

I need some help

# NOW YOU!

**Practice sheet:** everyone does Mild & Medium, then climb the peppers.

**Stuck?** Look back at Mr DJ's example at the top of the sheet.

**Need it again?** Watch "Coordinate Plane Explained: Plotting Points and Quadrants" on YouTube @MathWithMrDJ

**Brain break:** 3 new daily puzzles at [puzzles.mathwithmrdj.com](https://puzzles.mathwithmrdj.com)

