# Graphing in All Four Quadrants

Plot, solve, and measure with negatives

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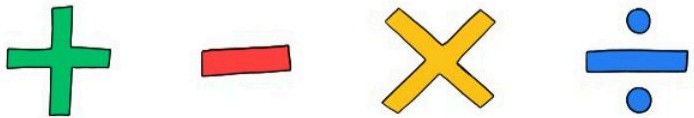
# Today we will...

**WE ARE LEARNING TO**

- Graph ordered pairs with negatives in all four quadrants.
- Solve real-world and math problems on the coordinate plane.
- Find distances with absolute value for aligned points.

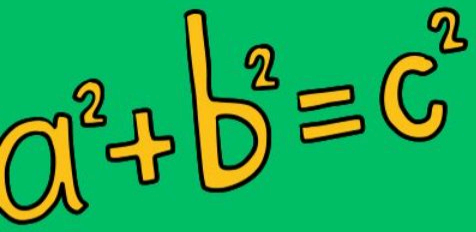
**SUCCESS LOOKS LIKE**

- ✓ I can plot (x, y) and name its quadrant.
- ✓ I can find distance when x's match or y's match.





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# Four Quadrants in One Look

↗

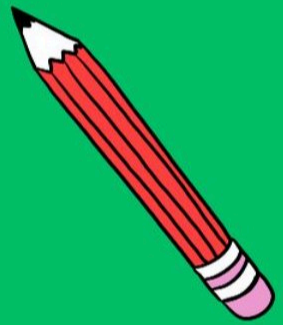
### Quadrant I

(+, +) goes right and up, like (3, 4).

↖

### Quadrant II

(-, +) goes left and up, like (-3, 2).



↙

### Quadrant III

(-, -) goes left and down, like (-4, -3).

↘

### Quadrant IV

(+, -) goes right and down, like (4, -3).

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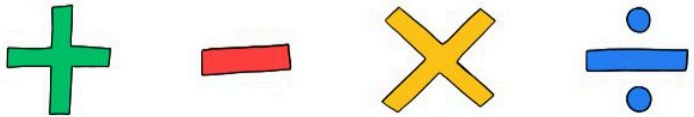
DID YOU KNOW?

# Our math map is named for a person.

French mathematician René Descartes shared two number lines to pinpoint locations, now called the Cartesian plane.



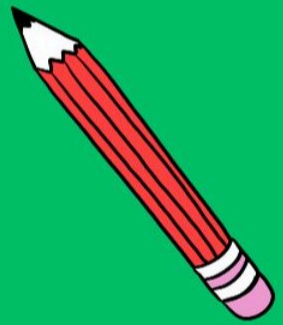
Photo: After Frans Hals · Public domain · Wikimedia Commons



$a^2+b^2=c^2$

# Where Would You Use This?

## Where would a 4-quadrant grid help you most?



A. Designing video game maps

B. Navigating with GPS

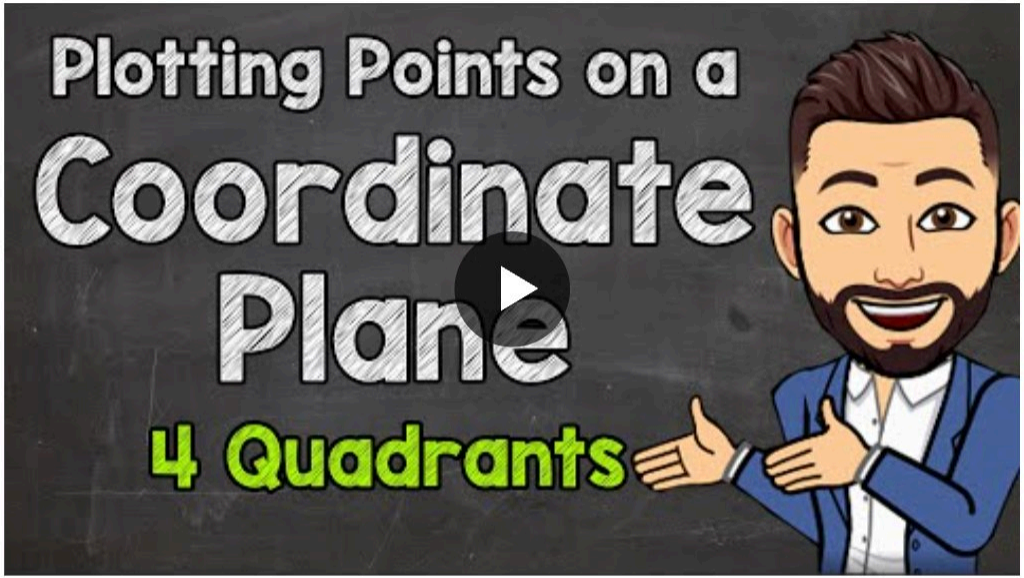
C. Tracking weather on a map

D. Making art with coordinates

Vote with your hands, then explain why.

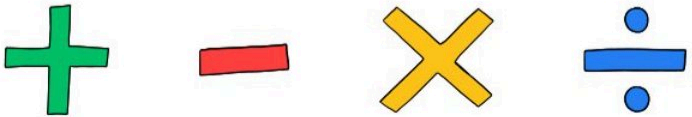
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# Plotting Everywhere




▶ 0:00 – 5:00

- Watch: move across first, then up or down.
- Listen: what does negative tell you to do?

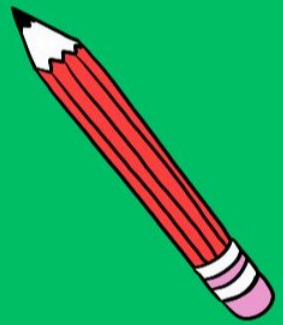


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$a^2+b^2=c^2$

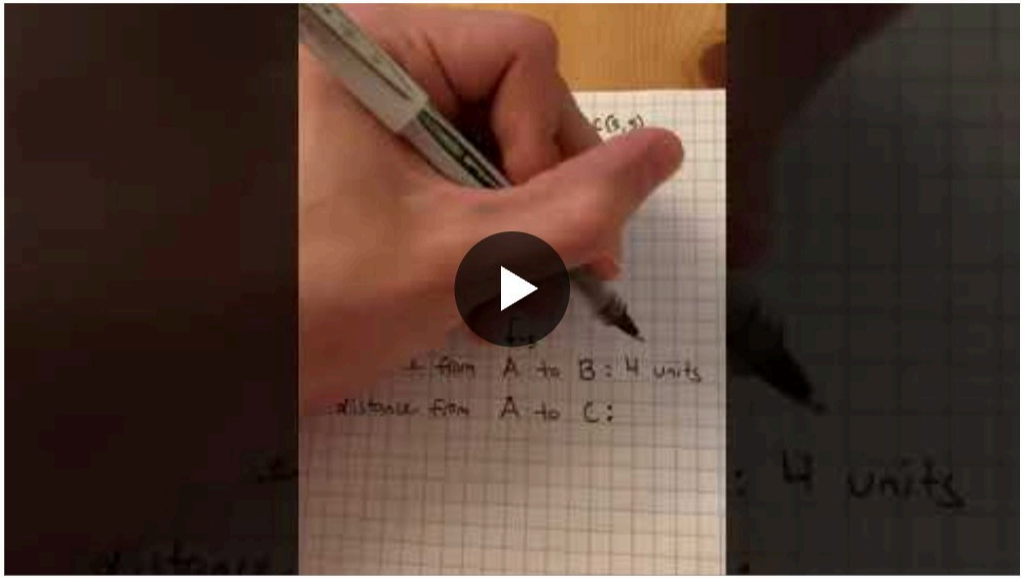
# Plot Like a Pro

1. Start at origin (0, 0) every time.
2. Go across with x: right +, left -.
3. Go up-down with y: up +, down -.
4. Order matters: (3, -2) is not (-2, 3).



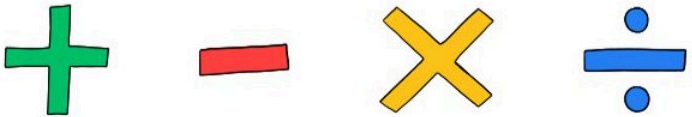
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# Distances Without Rulers



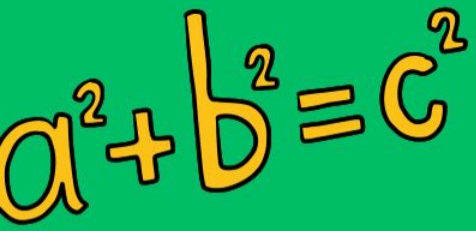

▶ 0:00 – 5:00

- Watch how absolute value finds distance.
- Spot pairs with same x or same y.





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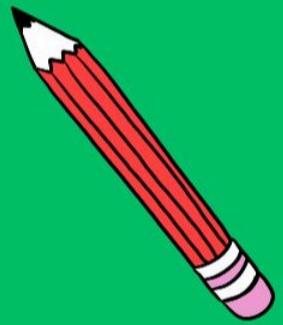

# Your task

**In pairs, plot and measure a rectangle on grid paper.**

1. Plot A (2, 3), B (-3, 3), C (-3, -2), D (2, -2), connect in order.
2. Find width with |2 - (-3)| and height with |3 - (-2)|.
3. Answer: how far is A to D? Show absolute value work.

**10 min**

**In pairs**



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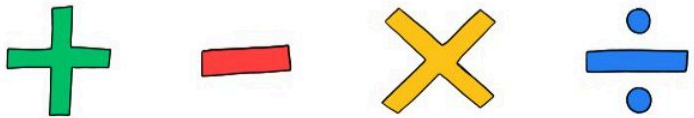
# Same X or Same Y?

## Same x: Up-Down

- Points line up vertically.
- Use y-coordinates only.
- Distance = $|y2 - y1|$

## Same y: Left-Right

- Points line up horizontally.
- Use x-coordinates only.
- Distance = $|x2 - x1|$



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$a^2+b^2=c^2$

## Think, pair, share

A student says distance from (−4, 5) to (3, 5) is |−4| + |3| = 7. Correct thinking?



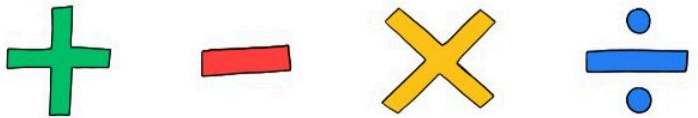
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# Quick quiz

1. Which quadrant holds (-5, 2)?

2. Find distance from (1, 4) to (1, -3).

3. A path goes from (-2, 1) to (4, 1). How long?





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