How Far From Zero?

Absolute value as distance and size

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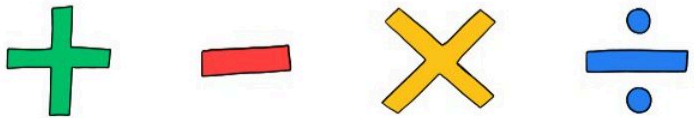
Value vs. Absolute Value

Value: -30

- Means $30 below zero
- Direction matters: you owe money
- Lives 30 left of 0

Absolute Value: |-30| = 30

- Means debt size is $30
- Direction ignored: how far?
- Lives 30 units from 0



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Illustration: RosZie · Pixabay

Below Zero Still Counts

It was -5°F in the morning. The cold's size is |-5| = 5 degrees from 0°F.

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Where Is Size Most Useful?

When does knowing the size matter more than + or −?

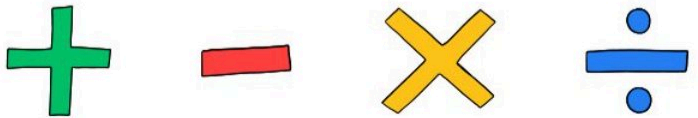
A Bank balance of -$30

B Temperature of -5°F

C Football loss of -10 yards

D Quiz change of -2 points

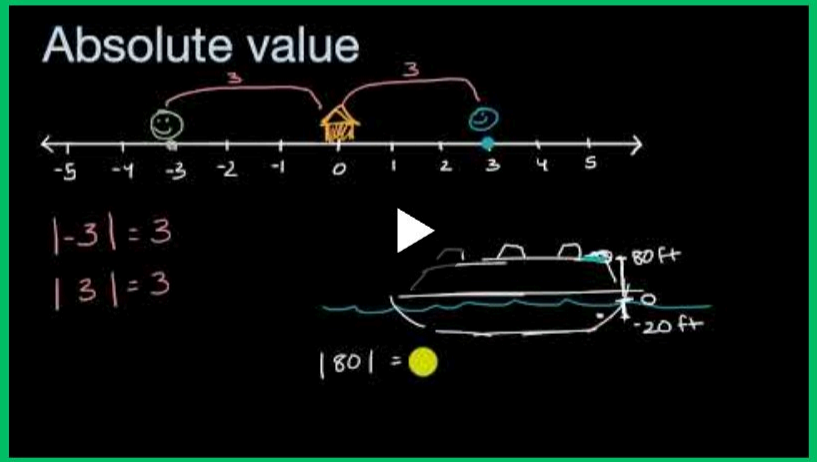
Vote with your hands, then explain why.



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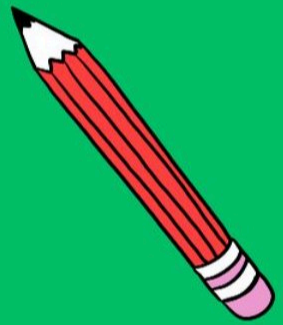
$a^2+b^2=c^2$

Distance From Zero



▶ 0:00 – 3:40

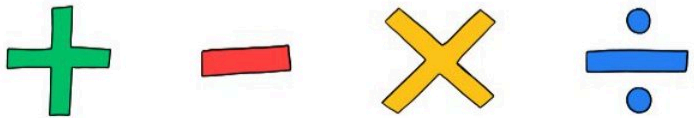
- Watch how |2| and |-2| both equal 2
- Listen for distance from 0
- Spot the jumps on the number line



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Absolute Value Map





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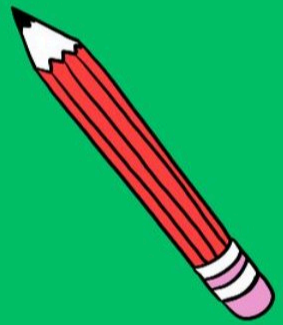
$a^2+b^2=c^2$

Size in Real Life



▶ 0:00 – 1:41

- Watch for debt: |-30| = 30 dollars
- Listen for the word magnitude
- Spot positive or negative starts



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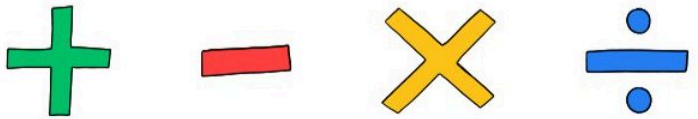
Your task

Plot 6 rational numbers and find their absolute values with your partner.

1. Draw 0-centered line -5 to 5, mark -3.5, -2, -1/2, 1.5, 2.75, 4
2. Count jumps to 0 and write | | = ?
3. Star biggest magnitude and explain why

10 min

In pairs

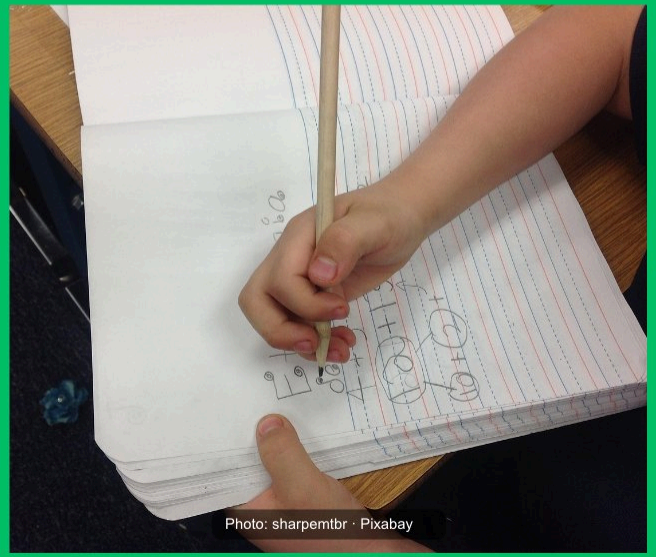


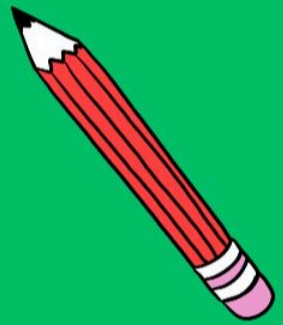
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$a^2+b^2=c^2$

Find It Fast

1. Inside | | can be fraction, decimal, integer
2. Find its distance from 0
3. Keep result positive, 0 stays 0
4. Example: |-3.5| = 3.5



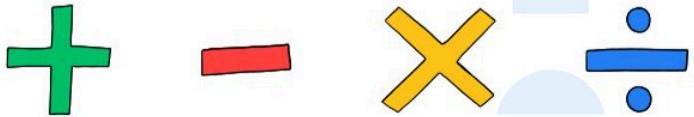


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Think, pair, share

Account shows -$30. Is the debt $30 or -$30? How does | | show it?





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

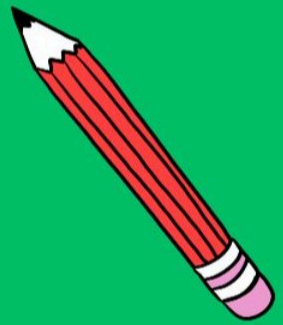
True or false?

|-4| = 4 because -4 is 4 units from 0.

|3.5| = -3.5

|-30| = 30 describes a $30 debt size.

|-2| and |2| are different.



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