

7th Grade Math Integers and Absolute Value

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1.1 Lesson

Check It Out
Lesson Tutorials
BigIdeasMath.com

Key Vocabulary
integer, p. 4
absolute value, p. 4

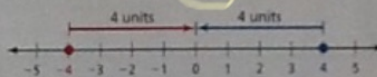
The following numbers are **integers**:
..., -3, -2, -1, 0, 1, 2, 3, ...

Integers
+ -

Key Idea

Absolute Value

Words The **absolute value** of an integer is the distance between the number and 0 on a number line. The absolute value of a number a is written as $|a|$.

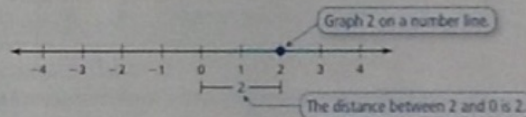


Numbers $|-4| = 4$ units to left $|4| = 4$ units to right

Distance is always a positive number

EXAMPLE 1 Finding Absolute Value

Find the absolute value of 2.



So, $|2| = 2$

EXAMPLE 2 Finding Absolute Value

Find the absolute value of -3.

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-4 -3 -2 -1 0 1 2 3 4
The distance between 2 and 0 is 2.

∴ So, $|2| = 2$.

EXAMPLE 2 Finding Absolute Value

Find the absolute value of -3 .

Graph -3 on a number line.

The distance between -3 and 0 is 3.

∴ So, $|-3| = 3$.


On Your Own
Find the absolute value.

1. $|7|$ 2. $|-1|$ 3. $|-5|$ 4. $|14|$

7 1 5 14

Chapter 1 Integers Multi-Language Glossary at BigIdeasMath.com

Or as I say "If it is between the lines, drop the signs!"

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EXAMPLE 3 Comparing Values

Remember
A number line can be used to compare and order integers. Numbers to the left are less than numbers to the right. Numbers to the right are greater than numbers to the left.

Compare 1 and $|-4|$.

Graph 1 on a number line.

Graph $|-4| = 4$ on a number line.

1 is to the left of $|-4|$.

∴ So, $1 < |-4|$.

On Your Own
Copy and complete the statement using $<$, $>$, or $=$.

5. $|-2|$ -1 6. -7 $|6|$

2 > -1 -7 < 6

7. $|10|$ 11 8. 9 $|-9|$


10 < 11 9 = 9

EXAMPLE 4 Real-Life Application

The freezing point is the temperature at which a liquid becomes a solid.

Substance	Freezing Point (°C)
Butter	35

a. Which substance in the table has the lowest

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7. |10| 11 8. 9 | -9|

EXAMPLE 4 Real-Life Application

The **freezing point** is the temperature at which a liquid becomes a solid.

Substance	Freezing Point (°C)
Butter	35
Airplane fuel	-53
Honey	-3
Mercury	-39
Candle wax	55

a. Which substance in the table has the lowest freezing point?
 b. Is the freezing point of mercury or butter closer to the freezing point of water, 0°C?

a. Graph each freezing point.

∴ Airplane fuel has the lowest freezing point, -53°C.

b. The freezing point of water is 0°C, so you can use absolute values.

Mercury: $|-39| = 39$ **>** Butter: $|35| = 35$

∴ Because 35 is less than 39, the freezing point of butter is closer to the freezing point of water.

On Your Own

9. Is the freezing point of airplane fuel or candle wax closer to the freezing point of water? Explain your reasoning.

$| -53 | \leq | 55 |$

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- Activity Recording Journal
- Activity Manipulatives
- Extra Practice Worksheets
- Fair Game Review Worksheets
- Glossary

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 to get
 Credit!
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Name _____ Date _____

1.1 Practice
For use after Lesson 1.1

Find the absolute value.

1. $|-1| = 1$ 2. $|-14| = 14$


3. $|0| = 0$ 4. $|6|$

Complete the statement using $<$, $>$, or $=$.

5. $6 \underline{>} |-2|$ 6. $-7 \underline{\leq} |-8|$

Yum! I'm full!!!

7. $|-9| \underline{>} 5$ 8. $|-2| \underline{=} 2$

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7. $|-9| \underline{>} 5$ 8. $|-2| \underline{=} 2$

Order the values from least to greatest.

9. ~~$4, 7, 1, 3, 4$~~ *write TOP*
 ~~$4, 7, 1, 3, 4$~~ *OR*
 $-4, -1, |-3|, 4, |7|$ *bottom*

10. $|2|, -3, |-5|, -1, 6$ *Rewrite Look Bottom Write top*

11. You download 12 new songs to your MP3 player. Then you delete 5 old songs. Write each amount as an integer.

Extra credit!

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