# Section 1.3: Operations on the Set of Real Numbers

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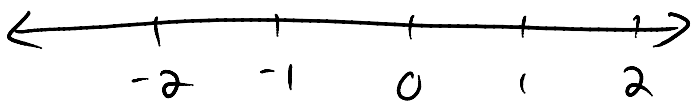
9:49 AM

## absolute value

- the absolute value of the number a is written

$$|a|$$




$|2| = 2$
$|-2| = 2$
$|0| = 0$

} absolute value is the distance from the origin (zero) on the real number line

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## the opposite of a number

- two numbers located on opposite sides of zero that have the same distance from the origin (absolute value) are said to be opposites of each other

3 and -3 are opposites of each other

0 is its own opposite

the opposite of 2 is $-(2) = -2$
the opposite of -2 is $-(-2) = 2$

formally, for any number $a$

$$-(-a) = a$$

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formally, for any number $a$

$$|a| = \begin{cases} a & \text{if } a \text{ is positive or zero} \\ -a & \text{if } a \text{ is negative} \end{cases}$$

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addition:

$$\begin{aligned} 2 + 3 &= 5 \\ -2 + 3 &= 1 \\ -2 + (-3) &= -5 \\ 2 + (-3) &= -1 \end{aligned}$$

subtraction:

$$\begin{aligned} 2 - 3 &= -1 \\ 2 - (-3) &= 5 \\ -2 - (-3) &= 1 \\ -2 - 3 &= -5 \end{aligned}$$

$a - b = a + (-b)$

multiplication:

$$\begin{aligned} 2 \cdot 3 &= 6 \\ 2 \cdot (-3) &= -6 \\ -2 \cdot (-3) &= 6 \\ (-2) \cdot 3 &= -6 \end{aligned}$$

notation: 2 times 3 $= 2 \cdot 3 = (2)(3) = 2(3)$
$= 2 \times 3$