Algebra 1 5.5

Solve and graph absolute value inequalities

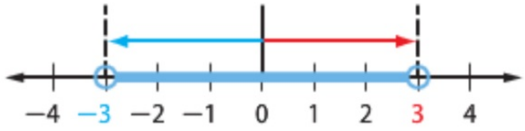
inequality
absolute value
less than
greater than
number line & distance
whiteboards

$|5| = 5$

distance: positive $|-1| = 1$ $|0| = 0$

Gr. 6-7 standard

1 Absolute Value Inequalities (<) The inequality $|x| < 3$ means that the distance between x and 0 is less than 3.



$|(3+-5)| = |-2| = 2$

| |=5

| |=8

| |=13

| |= -2

b. $|y-1|<-2$

$y-1=2$ $\quad +1 \quad +1$

$y=-1$

$y-1=2$ $\quad +1 \quad +1$

$y=3$

Trick question!

What could have been inside? :(
Find each end
Is the distance less or more?
What is in the middle?

Real-World Example 2 Apply Absolute Value Inequalities

INTERNET A recent survey showed that 65% of young adults watched online video clips. The margin of error was within 3 percentage points. Find the range of young adults who use video sharing sites.

$|\text{start}| \pm$

$65 \quad \pm 3$

$62 \leq x \leq 68$

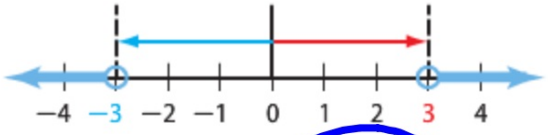
GuidedPractice

2. CHEMISTRY The melting point of ice is 0°C. During a chemistry experiment, Jill observed ice melting within 2°C of this measurement. Write the range of temperatures that Jill observed.

$|0| \pm 2$

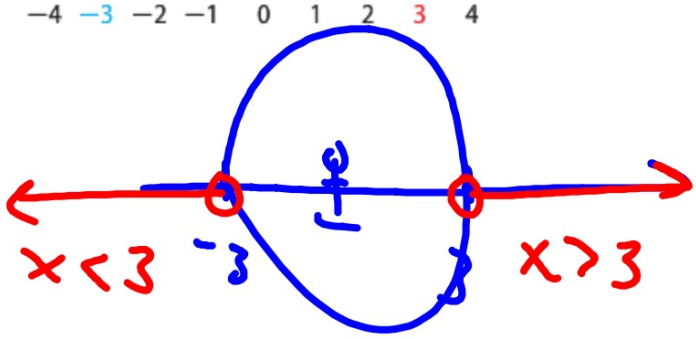
$-2 \leq t \leq 2$

2 Absolute Value Inequalities (>) The inequality $|x| > 3$ means that the distance between x and 0 is greater than 3.



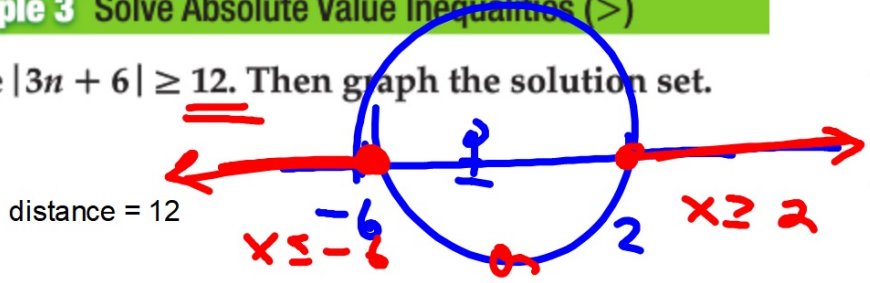
$|x| > 3$

$x = -3 \quad x = 3$



Example 3 Solve Absolute Value Inequalities (>)

Solve $|3n + 6| \geq 12$. Then graph the solution set.



What could have been inside?
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What is in the middle?

$3n+6=-12$ $\quad -6 \quad -6$

$3n = -18$

$\frac{3n}{3} = \frac{-18}{3}$

$n = -6$

$3n+6=12$ $\quad -6 \quad -6$

$3n = 6$

$\frac{3n}{3} = \frac{6}{3}$

$n = 2$

Solve each inequality. Then graph

3A. $|2k + 1| > 7$

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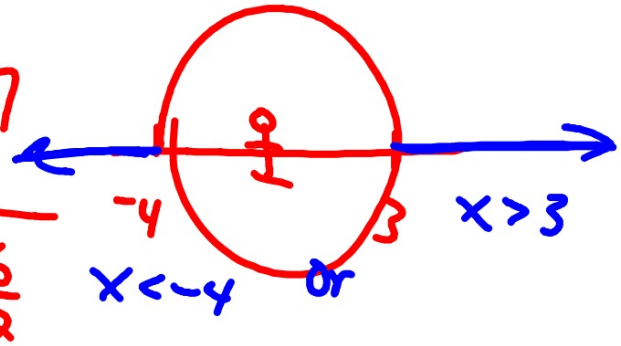
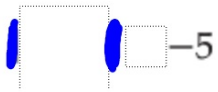
$2k+1 = -7$
$-1 \quad -1$
$2k = -8$
$\frac{2k}{2} = \frac{-8}{2}$
$k = -4$

$2k+1 = 7$
$-1 \quad -1$
$\frac{2k}{2} = \frac{6}{2}$
$k = 3$



3B.  −5

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