* warm up!

Notes 1-7
Multi-Step Equations Practice

Int 2 **Unit 1**

Solve the Multi-Step Equation or Inequality. Check your solution! Leave answers as a fraction or whole number.

$5n + 34 < -2(1 - 7n)$

$5n + 34 < -2 + 14n$

$-5n \quad\quad -5n$

$34 < -2 + 9n$

$+2 \quad\quad +2$

$\frac{36}{9} < \frac{9n}{9}$

$4 < n$

or $n > 4$

$2(4x - 3) - 8 = 4 + 2x$

$8x - 6 - 8 = 4 + 2x$

$8x - 14 = 4 + 2x$

$-2x \quad\quad -2x$

$6x - 14 = 4$

$+14 \quad\quad +14$

$\frac{6x}{6} = \frac{18}{6}$

$x = 3$

$6k - 1 = 20k + 3$

$-6k \quad\quad -6k$

$-1 = 14k + 3$

$-3 \quad\quad -3$

$\frac{-4}{14} = \frac{14k}{14}$

$-\frac{4}{14} = k$

$k = \frac{-4 \div 2}{14 \div 2} = \frac{-2}{7}$

$-3(4x + 3) + 4(6x + 1) = 43$

$-12x - 9 + 24x + 4 = 43$

$12x - 5 = 43$

$+5 \quad\quad +5$

$\frac{12x}{12} = \frac{48}{12}$

$x = 4$

Distance from 0

Review of Absolute Value:

To Break out of the box ask: How far away from 0? Answer isn't negative. Always positive.

Ex. 1 $|5| = 5$

5 away from 0.

Ex. 2 $|-13| = 13$

13 away from 0.

Ex. 3 $\left|\frac{3-18}{5}\right| = \left|\frac{-15}{5}\right|$

solve first

$|-3| = 3$

3 from 0.

Ex. 4 $\frac{|10+4|}{2} - |3-16| =$

$|14|$ $|-13|$

14 from 0 — 13 away

$\frac{14}{2} - 13$

$7 - 13 = -6$

Steps for Solving Absolute Value Equations:

1. BOX the Absolute Value portion of the Equation. Use Inverse operations to get it alone.
2. | | = something. ← Can you be that many steps from 0? like 8
   * if it is a − # answer is NO SOLUTION.
3. take what's inside the box & set it equal to + & − of what it = . Then solve each to get your 2 ANSWERS.

Solve each absolute value equation

Ex. 1: $|x| = 19$ what #'s are 19 away from 0? 19 & −19

$x = 19$

$x = -19$

Check your answer:

$|19| = 19$ Yes!

$|-19| = 19$ Yes!

Ex. 2: $|x + 6| = 9$ what #'s are 9 away from 0? 9 & −9

$x + 6 = 9$

$-6 \quad -6$

$x = 3$

$x + 6 = -9$

$-6 \quad -6$

$x = -15$

← answers! →

Check your answers!

$|3 + 6| = 9$

$|9| = 9$ ✓

$|-15 + 6| = 9$

$|-9| = 9$ ✓

Yes!

Int 2 | **Notes 1-8 Absolute Value Equations** | **Unit 1**

Ex. 3: $|x-7|+12=20$

$-12 \quad -12$

$|x-7|=8$

Box is alone!

what #'s are 8 away from 0?

$x-7=8$ | $x-7=-8$

$+7 \quad +7$ | $+7 \quad +7$

$x=15$ | $x=-1$

answers

Ex. 4: $\frac{|7-x|}{3}=8 \cdot 3$

$|7-x|=24$

Box is alone!

$7-x=24$ | $7-x=-24$

$-7 \quad -7$ | $-7 \quad -7$

$-x=17$ | $-x=-31$

$\frac{-x}{-1}=\frac{17}{-1}$ | $\frac{-x}{-1}=\frac{-31}{-1}$

$x=-17$ answers $x=31$

Ex. 5: $2|x+3|=22$

$\frac{2}{2} \quad \frac{22}{2}$

$|x+3|=11$

Box is alone

$x+3=11$ | $x+3=-11$

$-3 \quad -3$ | $-3 \quad -3$

$x=8$ answers $x=-14$

Ex. 6: $|x|=-34$

What numbers are -34 from 0?

None. 34 & -34 are both a distance of $+34$ from 0. answer cannot be a $-\#$

So, **NO SOLUTION**

Ex. 7: $|3x| - 5 = -2$

$+5 \quad +5$

$|3x| = 3$

$\frac{3x}{3} = \frac{3}{3}$ $\quad x = 1$

and

$\frac{3x}{3} = \frac{-3}{3}$ $\quad x = -1$

Ex.8 $|7x+5| = 12$ $\cdot -2$

$-2 \quad -2$

$|7x+5| = -24 \rightarrow$ NO SOLUTION