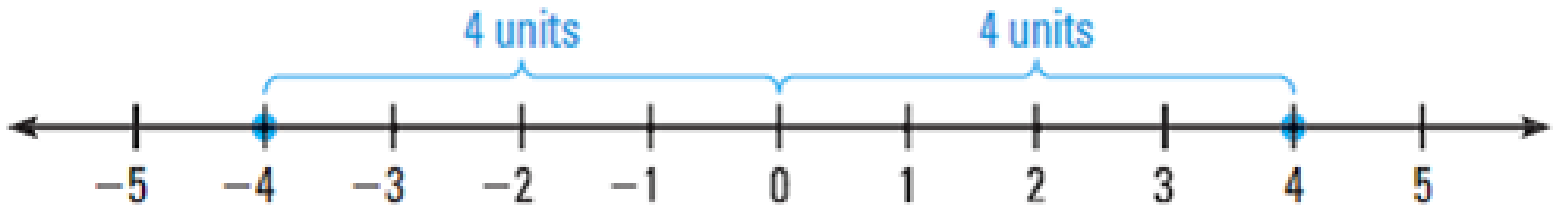
Absolute Value - the distance between a number and zero.



a. $|x| = 3$

$x = 3$ or $x = -3$

b. $|x| = 15$

$x = -15$. $x = 15$.

c. $|x| = 8$

$x = -8$ $x = 8$.

Solve an absolute value equation:

a. $|x - 3| = 8$

$x - 3 = 8$ or $x - 3 = -8$

$+3 \quad +3$ $\quad +3 \quad +3$

$x = 11$ $\quad x = -5$

b. $|x + 4| = 3$

$x + 4 = 3$ or $x + 4 = -3$

$-4 \quad -4$

$x + 4 - 4 = 3 - 4$

$x = -1$ $\quad x = -7$

Multi-step abs val equations:

$4 \cdot 6 - 5 = 19$ ✓

a. $4|x + 9| - 5 = 19$

$+5 \quad +5$

$\frac{4|x+9|}{4} = \frac{24}{4}$

$|x+9| = 6$

$x+9=6 \qquad x+9=-6$

$-9 \quad -9 \qquad -9 \quad -9$

$x=-3 \qquad x=-15$

b. $2|x + 1| + 4.1 = 18.9$

$-4.1 \quad -4.1$

$\frac{2|x+1|}{2} = \frac{14.8}{2}$

$|x+1| = 7.4$

$x+1=7.4 \qquad x+1=-7.4$

$-1 \quad -1.0 \qquad -1 \quad -1.0$

$x=6.4 \qquad x=-8.4$

Do we ever talk about negative distances?
Can we have a negative absolute value?

1. $3|2x - 8| + 3 = 2$

$-3 \quad -3$

$\frac{3|2x-8|}{3} = \frac{-1}{3}$

$|2x-8| = -\frac{1}{3}$

2 Solutions

2. $2|x - 5| + 4 = 2$

$-4 \quad -4$

$\frac{2|x-5|}{2} = \frac{-2}{2}$

$|x-5| = -1$

No Solution

3. $-3|x + 2| - 7 = -10$

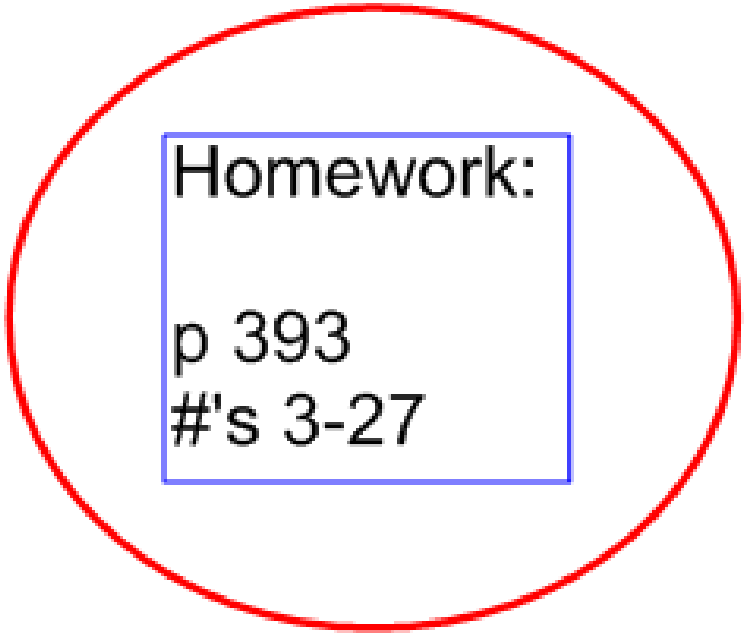
$+7 \quad +7$

$\frac{-3|x+2|}{-3} = \frac{-3}{-3}$

$|x+2| = 1$

$x+2=1$ $\quad$ $x+2=-1$.

$x=-1$ $\quad$ or $\quad$ $x=-3$.


Homework:
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