


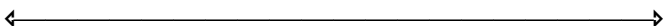
SOLVING AN ABSOLUTE VALUE EQUATION

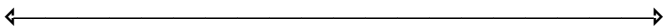
$|x|$ is the distance of the quantity x from the number 0

$$|-6| = 6$$

because the quantity -6 is 6 units away from the number 0

or as a diagram, 


The equation $|x| = 8$ is equivalent to
the sentence “the quantity x is 8 units away from the number 0” which corresponds to
the diagram  which gives
the solutions

The equation $|3x + 5| = 9$ is equivalent to
the sentence “the quantity _____ is _____ units away from the number 0” which corresponds to
the diagram  which gives
the solutions

To solve a more complicated equation like $2|3 - 2x| + 7 = 31$,

first isolate the absolute value,

which is equivalent to

the sentence “the quantity _____ is _____ units away from the number 0” which corresponds to
the diagram  which gives
the solutions

SOLVING AN ABSOLUTE VALUE INEQUALITY

Inequalities involving absolute values

do **NOT** behave like either equations involving absolute values

NOR like inequalities not involving absolute values

INEQUALITIES IN WHICH THE ABSOLUTE VALUE IS LESS THAN A QUANTITY

The inequality	$ x < 5$	is equivalent to
the sentence	“the quantity x is less than 5 units away from the number 0”	which corresponds to
the diagram	\longleftrightarrow	which gives
the solution		

The inequality	$ 6 - x < 7$	is equivalent to
the sentence	“the quantity _____ is _____ units away from the number 0”	which corresponds to
the diagram	\longleftrightarrow	which gives
the solution		

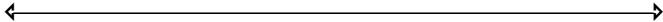
To solve a more complicated inequality like $2|x + 4| - 11 < 1$,


first isolate the absolute value,

which is equivalent to

the sentence	“the quantity _____ is _____ units away from the number 0”	which corresponds to
the diagram	\longleftrightarrow	which gives
the solution		

INEQUALITIES IN WHICH THE ABSOLUTE VALUE IS GREATER THAN A QUANTITY


The inequality	$ x > 3$	is equivalent to
the sentence	“the quantity x is more than 3 units away from the number 0”	which corresponds to
the diagram		which gives
the solution		

The inequality	$ 4x + 1 > 15$	is equivalent to
the sentence	“the quantity _____ is _____ units away from the number 0”	which corresponds to
the diagram		which gives
the solution		

To solve a more complicated inequality like $5 + 3|1 - x| > 9$,

first isolate the absolute value,

which is equivalent to

the sentence	“the quantity _____ is _____ units away from the number 0”	which corresponds to
the diagram		which gives
the solution		

Solve $7 + 2|x - 4| > 13$

Solve $11 - 4|x| > 3$