

Solving Absolute Value Inequalities

$$|x+3| > 10$$

$$\begin{array}{l} x+3=10 \\ x=7 \end{array} \quad \begin{array}{l} x+3=-10 \\ x=-13 \end{array}$$

$$x < -13 \text{ or } x > 7$$



$\begin{array}{l} -14+3 > 10 \\ -11 > 10 \\ 11 > 10 \\ 11 > 10 \\ \text{T} \end{array}$	$\begin{array}{l} 0+3 > 10 \\ 3 > 10 \\ 3 > 10 \\ \text{F} \end{array}$	$\begin{array}{l} 10+3 > 10 \\ 13 > 10 \\ 13 > 10 \\ \text{T} \end{array}$
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$$|2x-5| \leq 17$$

$$\begin{array}{l} 2x-5=17 \\ 2x=22 \\ x=11 \end{array} \quad \begin{array}{l} 2x-5=-17 \\ 2x=-12 \\ x=-6 \end{array}$$

$$-6 \leq x \leq 11$$



$\begin{array}{l} 2(-7)-5 \leq 17 \\ -14-5 \leq 17 \\ -19 \leq 17 \\ 19 \leq 17 \\ \text{F} \end{array}$	$\begin{array}{l} 2(0)-5 \leq 17 \\ 0-5 \leq 17 \\ -5 \leq 17 \\ 5 \leq 17 \\ \text{T} \end{array}$	$\begin{array}{l} 2(13)-5 \leq 17 \\ 26-5 \leq 17 \\ 21 \leq 17 \\ 21 \leq 17 \\ \text{F} \end{array}$
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$$|3x+7| \leq -4$$

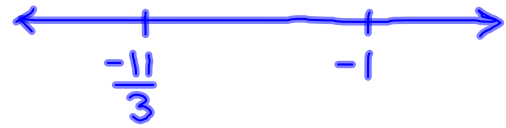
no solution $\{ \}$

$$3x+7=-4 \quad 3x+7=4$$

$$3x=-11 \quad 3x=-3$$

$$x = -\frac{11}{3}$$

$$x = -1$$



$$|3(-10)+7| \leq -4$$

$$|-30+7| \leq -4$$

$$|-23| \leq -4$$

$$23 \leq -4$$

F

$$|3(-2)+7| \leq -4$$

$$|-6+7| \leq -4$$

$$|1| \leq -4$$

$$1 \leq -4$$

F

$$|3(5)+7| \leq -4$$

$$|15+7| \leq -4$$

$$|22| \leq -4$$

$$22 \leq -4$$

F

absolute value is
always positive. A

positive # could never be

less than a negative # \therefore

this problem has no solution.

$$|10x+1| > -7$$

all real numbers

$$10x+1=-7 \quad 10x+1=7$$

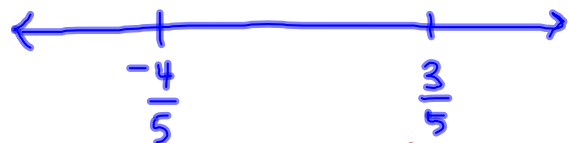
$$10x=-8 \quad 10x=6$$

$$x = -\frac{8}{10}$$

$$x = \frac{6}{10}$$

$$x = -\frac{4}{5}$$

$$x = \frac{3}{5}$$



$$|10(-5)+1| > -7$$

$$|-50+1| > -7$$

$$|-49| > -7$$

$$49 > -7$$

T

$$|10(0)+1| > -7$$

$$|0+1| > -7$$

$$|1| > -7$$

$$1 > -7$$

T

$$|10(3)+1| > -7$$

$$|30+1| > -7$$

$$|31| > -7$$

$$31 > -7$$

T

Absolute value is always
positive. A positive # will
always be greater than a
negative # \therefore the solution is
all real numbers.

HWK: p.83(15-26)