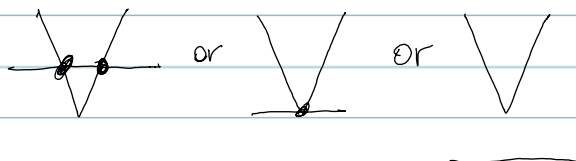


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Section 2.6 Absolute Value Equations

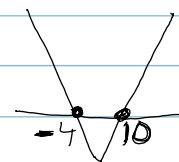
ex. $|x-3| = 7$



ex. $|x-3| = 7$

$$\begin{array}{r} x-3 = 7 \\ +3 \quad +3 \\ \hline x = 10 \end{array}$$

$$\begin{array}{r} x-3 = -7 \\ +3 \quad +3 \\ \hline x = -4 \end{array}$$



ex. $3|x-1| + 2 = 11$

like $3y + 2 = 11$

$$\begin{array}{r} 3y + 2 = 11 \\ -2 \quad -2 \\ \hline 3y = 9 \\ \frac{3}{3} \quad \frac{9}{3} \\ y = 3 \end{array}$$

$$\begin{array}{r} 3|x-1| + 2 = 11 \\ -2 \quad -2 \\ \hline 3|x-1| = 9 \end{array}$$

$$\frac{3|x-1|}{3} = \frac{9}{3}$$

$$|x-1| = 3$$

$$\begin{array}{r} x-1 = 3 \\ +1 \quad +1 \\ \hline x = 4 \end{array}$$

$$\begin{array}{r} x-1 = -3 \\ +1 \quad +1 \\ \hline x = -2 \end{array}$$

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

$$x + 2 = -4$$

$$\begin{array}{r} -2 \quad -2 \\ \hline x = -6 \end{array}$$

$$|-6 + 2| = -4$$

$$|-4| = -4$$

$$4 = -4$$

?

$$x + 2 = 4$$

$$\begin{array}{r} -2 \quad -2 \\ \hline x = 2 \end{array}$$

$$|2 + 2| = -4$$

$$|4| = -4$$

$$4 = -4$$

?

NO SOLUTION

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

$$\text{pos \#} = -4$$

$$|2| = -4$$

no solution

$$|x + 2| < -4$$

$$\text{pos. \#} < -4$$

$$|2| < -4$$

no solution

$$|x + 2| > -4$$

$$\text{pos \#} > -4$$

$$|2| > -4$$

all of them

$$\boxed{(-\infty, \infty)}$$

CONT. 9/7/2012

Section 2.7 Absolute Value Inequalities

* Absolute Value less thans — ands

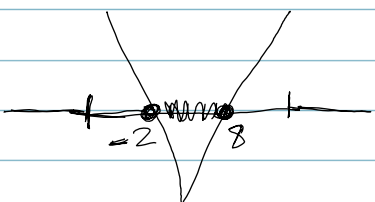
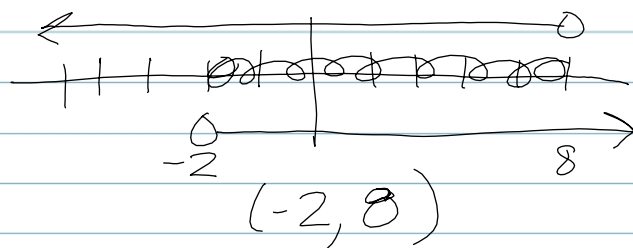
* Absolute Value greater thans — ors

- Absolute Value Less Thans

ANDS (Intersections) ^{common}

ex.1 $|x-3| < 5$

$$\begin{array}{r} x-3 < 5 \text{ and } x-3 > -5 \\ \hline +3 \quad +3 \qquad \qquad \quad +3 \quad +3 \\ \hline x < 8 \qquad \qquad \qquad \text{and} \qquad x > -2 \end{array}$$



ex.2

$$\begin{array}{r} -2|x+1| - 4 \geq 10 \\ \hline +4 \quad +4 \\ \hline -2|x+1| \geq 14 \\ \hline \frac{-2}{-2} |x+1| \geq \frac{14}{-2} \\ |x+1| \leq -7 \end{array}$$

$$\begin{array}{r} x+1 \leq -7 \text{ and } x+1 \geq 7 \\ \hline -1 \quad -1 \qquad \qquad \quad -1 \quad -1 \\ \hline x \leq -8 \qquad \qquad \qquad x \geq 6 \end{array}$$



no solution