3 Linear Inequalities

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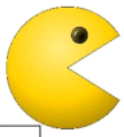
PRE-CALCULUS 11 Ch 8 & 9- Day 3: Linear Inequalities Review

Learning Outcome: I can understand inequalities & their graphs.

An **inequality** is used to model a situation that can be described by a range of numbers instead of a single number.

Exercise: Match each word/phrase with its corresponding inequality: *less than 8, greater than 8, less than or equal to 8, greater than or equal to 8, at most 8, no more than 8, at least 8, maximum 8, minimum 8, over 8, under 8, no larger than 8, cannot exceed 8, lower than 8.*



$x < 8$	$x > 8$	$x \leq 8$	$x \geq 8$
			
less than 8 under 8 lower than 8	greater than 8 over 8	less than or equal to 8 at most 8 no more than 8 max 8 cannot exceed 8 no larger than 8	greater than or equal to 8 at least 8 min 8

Graphing on a Number Line (with the variable on left side of inequality)

Set up the number line with the target number in the middle.

- If > or <, use ○ on target number.
- If ≥ or ≤, use ● on target number.
- If > or ≥, use right arrow ⟶
- If < or ≤, use left arrow ⟵

Example 1: Is each number a **solution** of the inequality $y \geq -3$?

(a) -4 $-4 \geq -3$ False ∴ No (Therefore) (b) 4 $4 \geq -3$ TRUE ∴ Yes (c) -3 $-3 \geq -3$ TRUE ∴ Yes

Example 2: Translate the following "**real life**" inequalities expressed in words or as signs into an inequality.

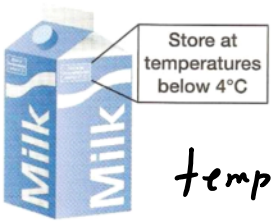
(a) People 16 and older can drive

$age \geq 16$

(b)

$speed \leq 55$

(c)



$temp < 4°$

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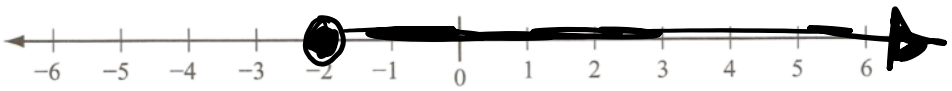
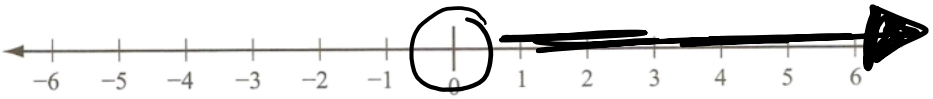
Example 3: Graph on the number line provided.

$x \geq -2$



$x < 4$

$x > 0$



Not only are their SINGLE inequalities, but there are **DOUBLE** inequalities too. Those involve a range of values that falls between 2 given numbers.

This is actually a combination of two inequalities,

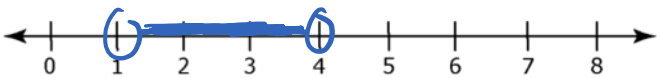
_____ and _____ .

Algebraically, this situation would look like the following:

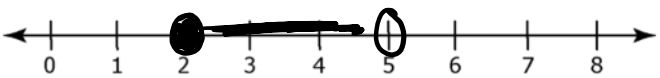
"Between" means do not include the "end points"

Example 4: Show the following on a number line and algebraically.

(a) Bill loses between one and four pounds after each hockey game.



(b) The temperature today will be at least $2^{o}C$, but less than $5^{o}C$



"Not" means "Opposite

(c) A number is not between -1 and 3.