

Notes: Inequalities

Verbal	Symbol
Less than	$<$
Greater than	$>$
Less than or equal to	\leq
Greater than or equal to	\geq
Not more than	\leq
Not less than	\geq
At least	\geq
At most	\leq
Not to exceed	\leq
Must be lower than	$<$
Cannot be less than	\geq

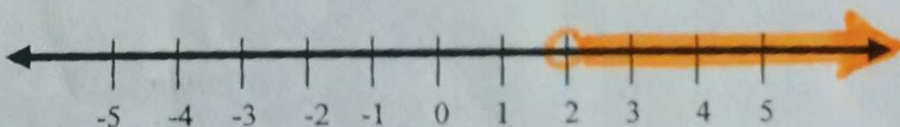
Translate the statements into an inequality.

- The speed limit, v , cannot exceed 45 miles per hour. $v \leq 45$
- The show size, s , is larger than 10. $s > 10$
- The body temperature, t , must be less than 104 degrees. $t < 104$
- The employee must work at least 40 hours. $h \geq 40$
- The TV, t , must cost less than \$140. $t < 140$
- The speed, s , of the meteor was more than 780 miles per hour. $s > 780$
- The most he can pay, p , is \$56. $p \leq 56$
- The number of doctors, d , must be at least 32 or more. $d \geq 32$
- The car is worth, w , at least \$3500. $w \geq 3500$

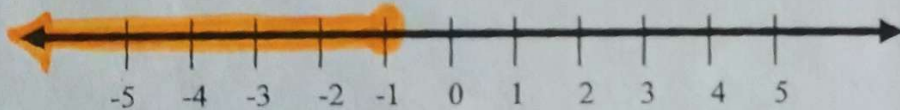
Graphing Inequalities

The solution of an inequality is all the numbers that make the inequality true. Usually there are too many to write down and therefore.... we graph them!

Example: $x > 2$



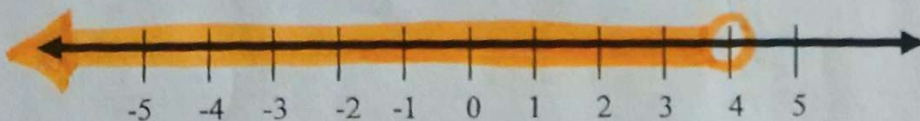
Example: $x \leq -1$



The line underneath the inequality means you have to _____ the circle.

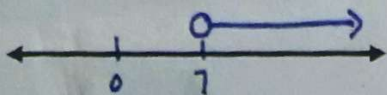
Example: $4 > x$

$$x < 4$$

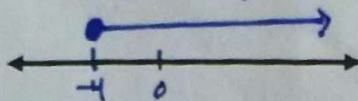


On your own... Graph the following inequalities on the number line.

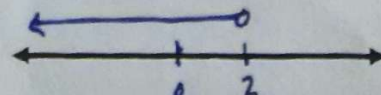
1) $x > 7$



2) $-4 \leq y$ $y \geq -4$



3) $b < 2$



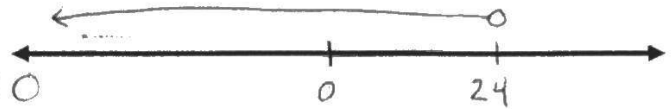
Solve each inequality and graph the solution.

1) $x - 9 < 15$
 $+9 \quad +9$

$x < 24$

Test Value: 0

$0 - 9 < 15$
 $-9 < 15 \checkmark$



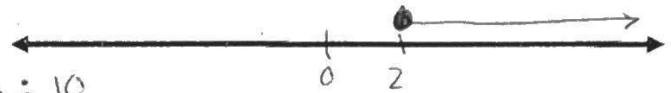
2) $3x - 1 \geq 5$
 $+1 \quad +1$

$3x \geq 6$

$x \geq 2$

Test Value: 10

$3(10) - 1 \geq 5$
 $30 - 1 \geq 5 \checkmark$
 $29 \geq 5 \checkmark$



3) $-2(x + 6) < -6$

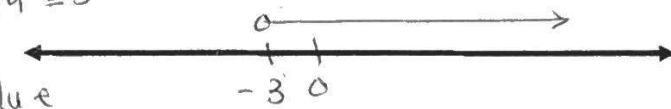
$-2x - 12 < -6$
 $+12 \quad +12$

$-2x < 6$

$x > -3$

Test Value

$-2(0 + 6) < -6$
 $-2(6) < -6$
 $-12 < -6 \checkmark$



RULE: When solving inequalities, if you MULTIPLY or DIVIDE by a NEGATIVE number, you must FLIP the ^{Symbol} sign!!

<p>a) $9 \geq -2m + 2 - 3$ $9 \geq -2m - 1$ $10 \geq -2m$ $-5 \leq m$ $m \geq -5$</p> <p>$9 \geq -2(0) + 2 - 3$ $9 \geq -1 \checkmark$</p>	<p>b) $5(6 + 3r) + 7 > 127$ $30 + 15r + 7 > 127$ $37 + 15r > 127$ $15r > 90$ $r > 6$</p> <p>$5(6 + 3(10)) + 7 > 127$ $5(36) + 7 > 127 \checkmark$</p>
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The test value can help to check if your shading is correct!!