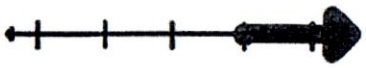
# Accelerated Math Notes (Section 8-6) Inequalities

$>$ $<$ $\leq$ $\geq$



"is greater than"

"is no more than"

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A mathematical sentence that contains any of the symbols listed below is called an inequality.

| $<$ | $>$ | $\leq$ | $\geq$ |
|---|---|---|---|
| • is less than<br>• is fewer than | • is greater than<br>• is more than<br>• exceeds | • is less than or equal to<br>• is no more than<br>• is at most | • is greater than or equal to<br>• is no less than<br>• is at least |

$x \leq 8$

Write an inequality for each sentence.

1) Your height (h) is greater than or equal to 48 in. $h \geq 48$ $48 \leq$

2) Your age (a) is at least 12 years. $a \geq 12$

3) Your weight (w) is at most 120 pounds. $w \leq 120$

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We can determine the Truth of an Inequality for a given value by checking if the value makes the inequality true or false.

True or False?

**$n - 9 < 4$ (for n = 6)**

$6 - 9 < 4$

$-3 < 4$ ✓

True

**$14 \leq \frac{a}{3} + 1$ (for a = 36)**

$14 \leq \frac{36}{3} + 1$

$14 \leq 12 + 1$

$14 \leq 13$

False

**$12 - m < 4$ (for m = -3)**

$12 - (-3) < 4$

$12 + 3 < 4$

$15 < 4$

False

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We can graph solutions to inequalities on the number line.

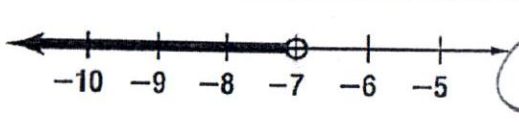
$x > 8$


The open circle means the number 8 is *not* included in the graph.

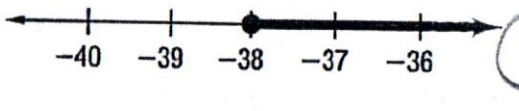
$x \leq 8$


The closed circle means the number 8 *is* included in the graph.

## Write the inequality for these graphs.

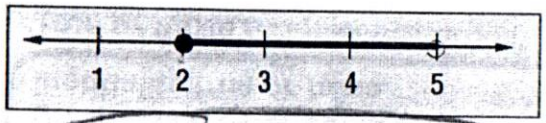



$x < -7$




$x \geq -38$

Read graph left to right



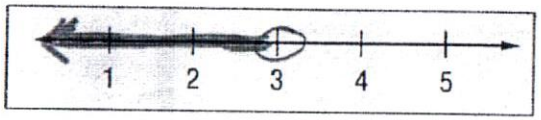

$2 \leq x < 5$

$n \geq 2$ and $n < 5$

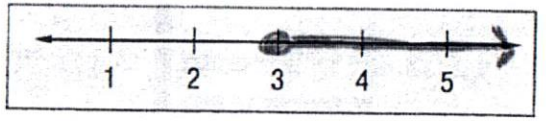
$5 > x \geq 2$

## Graph each inequality

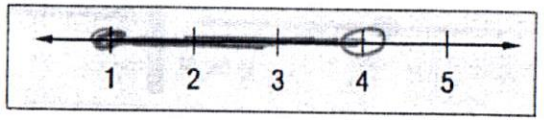
$x < 3$




$x \geq 3$




$1 \leq x < 4$




## How many ways can we represent this inequality?

"a number is no more than 3"

$n \leq 3$

$3 \geq n$

a # is a most 3


$x < -7$ standard form

variable on left

$-7 > x$