

# INEQUALITIES

An inequality is a statement that two quantities are not equal.

- $15 > 3$       15 is greater than 3
- $12 \leq 29$      12 is less than or equal to 29
- $41 \geq 18$      41 is greater than or equal to 18
- $17 < 90$       17 is less than 90

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Symbol	Meaning	Word Phrases
$<$	is less than	fewer than, below
$>$	is greater than	more than, above
$\leq$	is less than or equal to	at most, no more than
$\geq$	is greater than or equal to	at least, no less than

1. inequality - a mathematical sentence that shows the relationship between quantities that are not equivalent.

2. algebraic inequality - an inequality that contains at least one variable.  
 $x + 3 > 10$ ,  $5a > b + 3$

3. solution set - the set of values that make a statement true.

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1. There are at least 25 students in the auditorium.
2. No more than 150 people can occupy the room.
3. No more than 18 people are allowed in the gallery at one time.
4. There are fewer than 8 fish in the aquarium.
5. The water level is above 45 inches.
6. The temperature is below 40° F.
7. There are at least 24 pictures on the roll of film.
8. No more that 35 tables are in the cafeteria.
9. Fewer than 250 people attended the rally.
10. The waiting time for a table is at least 20 minutes.

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## Answers

1. number of students  $\geq 25$
2. room capacity  $\leq 150$
3. number of people  $\leq 18$
4. number of fish  $< 8$
5. water level  $> 45$
6. temperature  $< 40$
7. number of pictures  $\geq 24$
8. number of tables  $\leq 35$
9. number of people  $< 250$
10. waiting time  $\geq 20$

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You can graph the solutions of an inequality on a number line. If the variable is "greater than" or "less than a number", then that number is indicated with an open circle.

$$a > 5$$

This open circle indicates that 5 is not a solution.



If the variable is "greater than or equal to", or "less than or equal to" a number, that number is indicated with a closed circle.

$$b \leq 3$$

The closed circle indicates that 3 is a solution.



Graph each solution set on a number line.

1.  $x > 44$

2.  $y \leq 22$

3.  $c < 11$

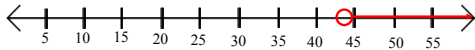
4.  $s \geq 16$

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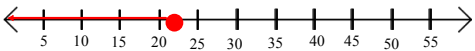
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## Answers

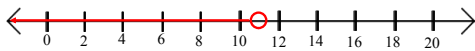
1.  $x > 44$



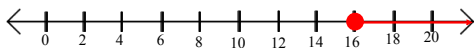
2.  $y \leq 22$



3.  $c < 11$



4.  $s \geq 16$



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