12.4 Inequalities

p. 692 1/30/18

An **inequality** states that two quantities either are not equal or may not be equal. An inequality uses one of the following symbols:

Symbol	Meaning	Word Phrases
< ()	is less than	Fewer than, below
> 🔿	is greater than	More than, above
≤ ●	is less than or equal to	At most, no more than
≥ ●	is greater than or equal to	At least, no less than

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Write an inequality for each situation.

A. There are at least 15 people in the waiting room.

x ≥15

B. The tram attendant will allow no more than 60 people on the tram.

 $X \leq 60$

- A. There are at most (10) gallons of gas in the tank.
- B. There is at least 10 yards of fabric left.

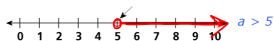
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An inequality that contains a variable is an **algebraic inequality**. A value of the variable that makes the inequality true is a solution of the inequality.

An inequality may have more than one solution. Together, all of the solutions are called the **solution set**.

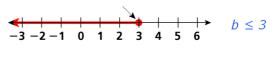
You can graph the solutions of an inequality on a number line. If the variable is "greater than" or "less than" a number, then that number is indicated with an open circle.

This open circle shows 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.

This closed circle shows that 3 is a solution.



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Graph each inequality.

A. n < 3



B. $a \ge -4$



Graph each inequality.

 $A. p \leq 2$



B. e > -2



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Write an inequality for each situation.

1. No more than 220 people are in the theater.

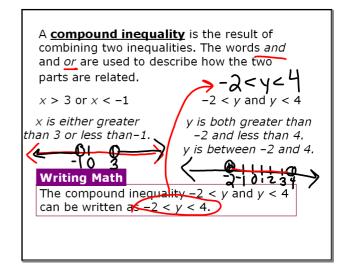
$$x \leq 220$$

2. There are at least a dozen eggs left.

3. Fewer than 14 people attended the meeting.



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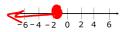
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Graph each compound inequality.

 $m \le -2 \text{ or } m > 1$

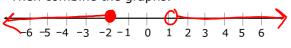
First graph each inequality separately.

m > 1

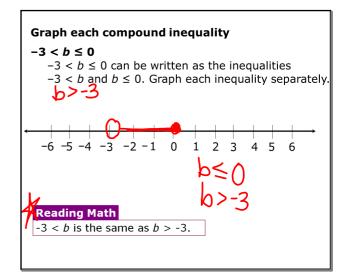


-6-4-2 0 2 4 6

Then combine the graphs.



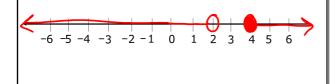
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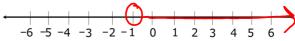
Graph each compound inequality.

w < 2 or $w \ge 4$

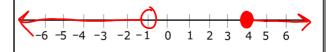


Graph the inequalities.

4. x > -1



5. $x \ge 4$ or x < -1



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