I can use substitution to determine if a given value is a solution to an equation or inequality.

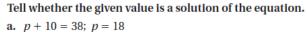
A **solution** of an equation is a value that makes the equation true.

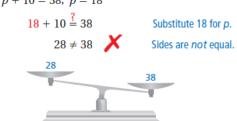
Value of <i>x</i>	<i>x</i> + 3 = 7	Are both sides equal?
3	$3 + 3 \stackrel{?}{=} 7$ $6 \neq 7 \checkmark$	no
4	$4 + 3 \stackrel{?}{=} 7$ 7 = 7 \langle	yes
5	$5 + 3 \stackrel{?}{=} 7$ 8 \ne 7 \times 1	no

So, the value x = 4 is a solution of the equation x + 3 = 7.

EXAMPLE 🚹 📒

Checking Solutions





So, p = 18 is not a solution.

b. 4y = 56; y = 14



So, y = 14 is a solution.

<u>Indicator 22 Class Notes by Mrs. Joshi</u> <u>Substitution to Solve Equations and</u> <u>Inequalities-(AL Standard 18)</u>

An **inequality** is a mathematical sentence that compares expressions. It contains the symbols <, >, \leq , or \geq . To write an inequality, look for the following phrases to determine where to place the inequality symbol.

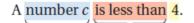
Inequality Symbols					
Symbol	<	>	≤	2	
Key Phrases	 is less than is fewer than 	 is greater than is more than 	 is less than or equal to is at most is no more than 	 is greater than or equal to is at least is no less than 	

EXAMPLE 1 Wri

1 Writing Inequalities

Write the word sentence as an inequality.

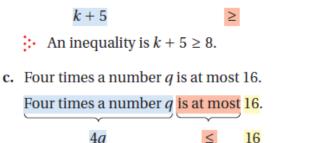
a. A number *c* is less than 4.



- c < 4 $\therefore \text{ An inequality is } c < 4.$
- **b.** A number *k* plus 5 is greater than or equal to 8.

A number k plus 5 is greater than or equal to 8.

8



	19
þ.	An inequality is $4q \le 16$.

A **solution of an inequality** is a value that makes the inequality true. An inequality can have more than one solution. The set of all solutions of an inequality is called the **solution set**.

Value of <i>x</i>	<i>x</i> + 3 ≤ 7	Is the inequality true?
3	$3 + 3 \stackrel{?}{\leq} 7$ $6 \leq 7 \checkmark$	yes
4	$4 + 3 \stackrel{?}{\leq} 7$ $7 \leq 7 \checkmark$	yes
5	$5 + 3 \stackrel{?}{\leq} 7$ $8 \not\leq 7 \not\times$	no

EXAMPLE 2 Checking Solutions

Tell whether the given value is a solution of the inequality.

a. $x + 1 > 7; x = 8$		
x + 1 > 7	Write the inequality.	
$8 + 1 \stackrel{?}{>} 7$	Substitute 8 for <i>x</i> .	
9 > 7 🗸	Add. 9 is greater than 7.	
So, 8 is a solution of the inequality.		
b. $7y < 27; y = 4$		
7 y < 27	Write the inequality.	
7(4) [?] 27	Substitute 4 for y.	
28 ≰ 27 🗡	Multiply. 28 is not less than 27.	
So, 4 is <i>not</i> a solution of the inequality.		
c. $\frac{z}{3} \ge 5; \ z = 15$		
$\frac{z}{3} \ge 5$	Write the inequality.	
$\frac{15}{3} \stackrel{?}{\geq} 5$	Substitute 15 for <i>z</i> .	
$5 \ge 5$	Divide. 5 is greater than or equal to 5.	
So, 15 is a solution of the inequality.		

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