Teacher Lesson Plan

Lesson: 6.2.6 (Day 2) - Supplement
Multi-Step Inequalities with Distributive Property

CC Standards

7.EE.4b Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

b) Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Objective

The student will solve multi-step inequalities by combining like terms and distributing. The student will graph solutions to multi-step inequalities.

Mathematical Practices

#1 Make sense of problems and persevere in solving them.
#5 Use appropriate tools strategically.
#6 Attend to precision.
#7 Look for and make use of structure.

Teacher Input

Bellwork: Review bellwork.
Homework: Review important problems assigned the previous night.
Introduction: Introduce as directed on the PowerPoint.
Lesson: Teach as directed by PowerPoint. Look at each slide for additional comments and answers. Make sure students follow along in their notes.

Classwork

Pages 5-6

Homework

Page 7

Extra Practice

This link will take you to a really good practice worksheet on this objective. The problems include 2-step equations and equations involving the distributive property. They are also provided a number line to graph the solution.
http://cdn.kutasoftware.com/Worksheets/Alg1/Two-Step%20Inequalities.pdf

Pages 8-9 below might be good for struggling students.

Closure

See last slide for closure, or close with an activity.

Student Notes

Steps for solving any Equation or Inequality

1) Distribute if you can.
2) Combine the like terms.
3) Solve the simplified equation by undoing in reverse.
4) Check your answer.

When solving an inequality, remember to reverse the symbol when multiplying or dividing both sides by a negative number. Look for the variable. If it is teamed up with a negative number then you will have to flip it!

Guided Practice #1

$12 + 9j + j \leq 72$

You Try #1

$12b - 3b + 5 \geq -31$

Guided Practice #2

$3z - 15z - 30 > 54$

You Try #2

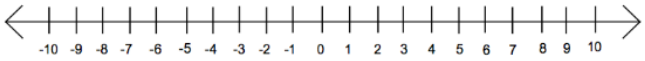
$7n - 8n - 3 < 23$

Guided Practice #3

$-9(q+3) < 45$

You Try #3

$-5(x+2) > 15$



Guided Practice #4

$\frac{1}{2}(x+4) \leq 10$

You Try #4

$\frac{3}{4}(x+3) \leq 9$

Guided Practice #5

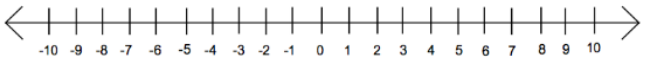
$5x + 2(x+1) \geq 23$

You Try #5

$6y + 2(2y+3) > 16$

Guided Practice #6

$\frac{3x+4}{3} - \frac{15x}{3} < 6$

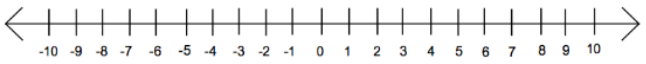


You Try #6

$\frac{x+4}{3} - 8 \leq -2$

Guided Practice #7

$3x - (x - 7) \leq 18$

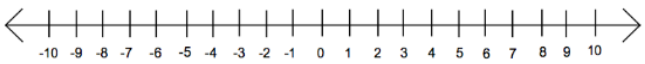


You Try #7

$2x - (x + 3) > 9$

Guided Practice #8

$3(2x + 2) - (x - 4) < 18$



You Try #8

$4(3 - x) - 3(4 - x) > -15$

Classwork

Name_____ Date_____ Period_____

Solve.

1. $3(x + 4) > 21$

2. $4(x - 1) < 8$

3. $5(y + 7) < 70$

4. $-4(x + 2) > 8$

5. $3(x - 9) \geq 30$

6. $-2(y + 4) \geq 16$

7. $5(x + 2) \leq 100$

8. $-2(y - 3) + 12y > 16$

9. $4(x + 2) - 10x > 38$

10. $3(x - 2) + 5x \leq 42$

11. $-2(y+4)-2y>8$

12. $-5(x+2)+6(x-2)\geq 10$

13. $3(x+4)-2(x+1)>5$

14. $-2(y-4)+8y+2<16$

15. $-8(x+2)-9x+2x\geq 14$

16. $\frac{2}{3}(3x-6)+1\ \leq 5$

17. $3+\frac{x}{5}+16>22$

18. $11\ +\frac{6-x}{2}<26$

19. $4-(x+2)>\ -7$

20. $0.3(x-2)+0.1\leq 0.4$

Homework

Name_____ Date_____ Period_____

Solve and Graph.

1. $18 + 7n + 3 + 6n \leq 86$

2. $3(x - 2) > 21$

3. $-2(y + 3) \leq 12$

4. $\frac{2}{5}(x + 10) \geq 2$

5. $-5x + 4(x - 2) < 0$

6. $4x - (-2x + 6) > 12$

Extra Practice

Name_____ Date_____ Period_____

Inequalities - Round 1

Directions: Write the solution of each inequality.

1.	$x + 1 > 8$	
2.	$x + 2 > 8$	
3.	$x + 3 > 8$	
4.	$x + 4 > 8$	
5.	$x - 1 > 3$	
6.	$x - 2 > 3$	
7.	$x - 3 > 3$	
8.	$x - 4 > 3$	
9.	$3x > 15$	
10.	$3x > 18$	
11.	$3x > 21$	
12.	$3x > 24$	
13.	$-x > 4$	
14.	$-x > 5$	
15.	$-x > 6$	
16.	$-x < -4$	
17.	$-x < -5$	
18.	$-x < -6$	
19.	$\frac{1}{2}x > 1$	
20.	$\frac{1}{2}x > 2$	
21.	$\frac{1}{2}x > 3$	
22.	$\frac{1}{2}x > 4$	

23.	$-\frac{1}{5}x > 2$	
24.	$-\frac{2}{5}x > 2$	
25.	$-\frac{3}{5}x > 3$	
26.	$-\frac{4}{5}x > 4$	
27.	$2x + 4 > 8$	
28.	$2x + 5 > 9$	
29.	$2x + 6 > 10$	
30.	$2x - 1 < 5$	
31.	$2x - 3 < 5$	
32.	$2x - 5 < 5$	
33.	$-2x + 1 > 7$	
34.	$-2x + 2 > -8$	
35.	$-2x + 3 > 9$	
36.	$-3x + 1 > -8$	
37.	$-3x + 1 > 10$	
38.	$-3x + 1 > 13$	
39.	$2(x + 3) > 4$	
40.	$3(x + 3) < 6$	
41.	$4(x + 3) > 8$	
42.	$-5(x - 3) < -10$	
43.	$-2(x - 3) > 8$	
44.	$-2(x + 3) < 8$	

Extra Practice

Name_____ Date_____ Period_____

Inequalities—Round 2

Directions: Write the solution of each inequality.

1.	$x + 6 < 9$	
2.	$x + 5 < 9$	
3.	$x + 4 < 9$	
4.	$x + 3 < 9$	
5.	$x - 3 < 5$	
6.	$x - 4 < 5$	
7.	$x - 5 < 5$	
8.	$x - 6 < 5$	
9.	$4x < 20$	
10.	$4x < 16$	
11.	$4x < 12$	
12.	$4x < 8$	
13.	$-x < 6$	
14.	$-x < 5$	
15.	$-x < 4$	
16.	$-x < -8$	
17.	$-x < -7$	
18.	$-x < -6$	
19.	$\frac{1}{5}x < 1$	
20.	$\frac{1}{5}x < 2$	
21.	$\frac{1}{5}x < 3$	
22.	$\frac{1}{5}x < 4$	

23.	$-\frac{1}{6}x < 2$	
24.	$-\frac{2}{6}x < 2$	
25.	$-\frac{3}{6}x < 3$	
26.	$-\frac{4}{6}x < 4$	
27.	$3x + 3 < 6$	
28.	$3x + 4 < 7$	
29.	$3x + 5 < 8$	
30.	$3x - 1 > 5$	
31.	$3x - 4 > 5$	
32.	$3x - 7 > 5$	
33.	$l - 3x + 1 < 7$	
34.	$-3x + 2 < -7$	
35.	$-3x + 3 < 9$	
36.	$-4x + 1 < -11$	
37.	$-4x + 1 < -7$	
38.	$-4x + 1 < -3$	
39.	$3(x + 2) < 9$	
40.	$4(x + 2) < 12$	
41.	$5(x + 2) > 15$	
42.	$-2(x + 1) < 4$	
43.	$-3(2x - 1) < -9$	
44.	$-5(4x + 1) < 15$	

Answer Keys

Student Notes

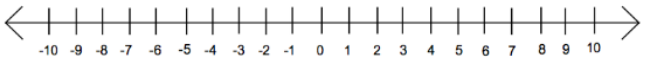
Steps for solving any Equation or Inequality

5) Distribute if you can.
6) Combine the like terms.
7) Solve the simplified equation by undoing in reverse.
8) Check your answer.

When solving an inequality, remember to reverse the symbol when multiplying or dividing both sides by a negative number. Look for the variable. If it is teamed up with a negative number then you will have to flip it!

Guided Practice #1

$12 + 9j + j \leq 72$ ***j ≤ 6***



You Try #1

$12b - 3b + 5 \geq -31$ ***b ≥ -4***

Guided Practice #2

$3z - 15z - 30 > 54$ ***z < -7***

You Try #2

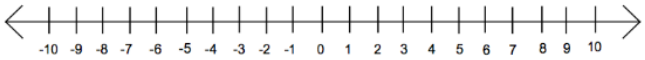
$7n - 8n - 3 < 23$ ***n > -26***

Guided Practice #3

$-9(q+3) < 45$ ***q > -8***

You Try #3

$-5(x+2) > 15$ ***q < -5***



Guided Practice #4

$\frac{1}{2}(x+4) \leq 10$ ***x ≤ 16***

You Try #4

$\frac{3}{4}(x+3) \leq 9$ ***x≤ 9***

Guided Practice #5

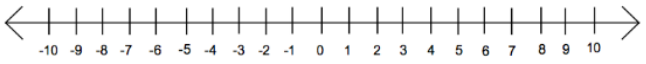
$5x + 2(x+1) \geq 23$ ***x ≥ 3***

You Try #5

$6y + 2(2y+3) > 16$ ***y>1***

Guided Practice #6

$\frac{3x+4}{3} - \frac{15x}{3} < 6$ ***x* > $-\frac{7}{6}$**



You Try #6

$\frac{x+4}{3} - 8 \leq -2$ ***x*≤ 14**

Guided Practice #7

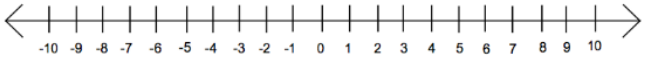
$3x - (x - 7) \leq 18$ ***x* ≤ $\frac{11}{2}$**

You Try #7

$2x - (x + 3) > 9$ ***x* > 12**

Guided Practice #8

$3(2x + 2) - (x - 4) < 18$ ***x* < $\frac{8}{5}$**



You Try #8

$4(3 - x) - 3(4 - x) > -15$ ***x*<15**

Classwork

Name_____ Date_____ Period_____

Solve.

1. $3(x+4) > 21$ $\boldsymbol{x > 3}$

2. $4(x-1) < 8$ $\boldsymbol{x < 3}$

3. $5(y+7) < 70$ $\boldsymbol{x < 7}$

4. $-4(x+2) > 8$ $\boldsymbol{x < -4}$

5. $3(x-9) \geq 30$ $\boldsymbol{x \geq 19}$

6. $-2(y+4) \geq 16$ $\boldsymbol{x \leq -12}$

7. $5(x+2) \leq 100$ $\boldsymbol{x \leq 18}$

8. $-2(y-3) + 12y > 16$ $\boldsymbol{y > 1}$

9. $4(x+2) - 10x > 38$ $\boldsymbol{x < -5}$

10. $3(x-2) + 5x \leq 42$ $\boldsymbol{x \leq 6}$

11. $-2(y+4)-2y>8$ **$y<-4$**

12. $-5(x+2)+6(x-2)\geq 10$ **$x\geq 32$**

13. $3(x+4)-2(x+1)>5$ **$x>-5$**

14. $-2(y-4)+8y+2<16$ **$y<1$**

15. $-8(x+2)-9x+2x\geq 14$ **$x\leq -2$**

16. $\frac{2}{3}(3x-6)+1\leq 5$ **$x\leq 4$**

17. $3+\frac{x}{5}+16>22$ **$x>15$**

18. $11+\frac{6-x}{2}<26$ **$x>-24$**

19. $4-(x+2)>-7$ **$x<9$**

20. $0.3(x-2)+0.1\leq 0.4$ **$x\leq 3$**

Homework

Name_____ Date_____ Period_____

Solve and Graph.

1. $18 + 7n + 3 + 6n \leq 86$ **$n \leq 5$**

2. $3(x - 2) > 21$ **$x > 9$**

3. $-2(y + 3) \leq 12$ **$y \geq -9$**

4. $\frac{2}{5}(x + 10) \geq 2$ **$x \geq -5$**

5. $-5x + 4(x - 2) < 0$ **$x > -8$**

6. $4x - (-2x + 6) > 12$ **$x > 3$**

Extra Practice

Inequalities - Round 1 [KEY]

Directions: Write the solution of each inequality.

1.	$x+1>8$	$x>7$
2.	$x+2>8$	$x>6$
3.	$x+3>8$	$x>5$
4.	$x+4>8$	$x>4$
5.	$x-1>3$	$x>4$
6.	$x-2>3$	$x>5$
7.	$x-3>3$	$x>6$
8.	$x-4>3$	$x>7$
9.	$3x>15$	$x>5$
10.	$3x>18$	$x>6$
11.	$3x>21$	$x>7$
12.	$3x>24$	$x>8$
13.	$-x>4$	$x<-4$
14.	$-x>5$	$x<-5$
15.	$-x>6$	$x<-6$
16.	$-x<-4$	$x>4$
17.	$-x<-5$	$x>5$
18.	$-x<-6$	$x>6$
19.	$\frac{1}{2}x>1$	$x>2$
20.	$\frac{1}{2}x>2$	$x>4$
21.	$\frac{1}{2}x>3$	$x>6$
22.	$\frac{1}{2}x>4$	$x>8$

23.	$-\frac{1}{5}x>2$	$x<-10$
24.	$-\frac{2}{5}x>2$	$x<-5$
25.	$-\frac{3}{5}x>3$	$x<-5$
26.	$-\frac{4}{5}x>4$	$x<-5$
27.	$2x+4>8$	$x>2$
28.	$2x+5>9$	$x>2$
29.	$2x+6>10$	$x>2$
30.	$2x-1<5$	$x<3$
31.	$2x-3<5$	$x<4$
32.	$2x-5<5$	$x<5$
33.	$-2x+1>7$	$x<-3$
34.	$-2x+2>-8$	$x<5$
35.	$-2x+3>9$	$x<-3$
36.	$-3x+1>-8$	$x<3$
37.	$-3x+1>10$	$x<-3$
38.	$-3x+1>13$	$x<-4$
39.	$2(x+3)>4$	$x>-1$
40.	$3(x+3)<6$	$x<-1$
41.	$4(x+3)>8$	$x>-1$
42.	$-5(x-3)<-10$	$x>5$
43.	$-2(x-3)>8$	$x<-1$
44.	$-2(x+3)<8$	$x>-7$

Extra Practice

Inequalities—Round 2 [KEY]

Directions: Write the solution of each inequality.

1.	$x + 6 < 9$	$\boldsymbol{x < 3}$
2.	$x + 5 < 9$	$\boldsymbol{x < 4}$
3.	$x + 4 < 9$	$\boldsymbol{x < 5}$
4.	$x + 3 < 9$	$\boldsymbol{x < 6}$
5.	$x - 3 < 5$	$\boldsymbol{x < 8}$
6.	$x - 4 < 5$	$\boldsymbol{x < 9}$
7.	$x - 5 < 5$	$\boldsymbol{x < 10}$
8.	$x - 6 < 5$	$\boldsymbol{x < 11}$
9.	$4x < 20$	$\boldsymbol{x < 5}$
10.	$4x < 16$	$\boldsymbol{x < 4}$
11.	$4x < 12$	$\boldsymbol{x < 3}$
12.	$4x < 8$	$\boldsymbol{x < 2}$
13.	$-x < 6$	$\boldsymbol{x > -6}$
14.	$-x < 5$	$\boldsymbol{x > -5}$
15.	$-x < 4$	$\boldsymbol{x > -4}$
16.	$-x < -8$	$\boldsymbol{x > 8}$
17.	$-x < -7$	$\boldsymbol{x > 7}$
18.	$-x < -6$	$\boldsymbol{x > 6}$
19.	$\frac{1}{5}x < 1$	$\boldsymbol{x < 5}$
20.	$\frac{1}{5}x < 2$	$\boldsymbol{x < 10}$
21.	$\frac{1}{5}x < 3$	$\boldsymbol{x < 15}$
22.	$\frac{1}{5}x < 4$	$\boldsymbol{x < 20}$
23.	$-\frac{1}{6}x < 2$	$\boldsymbol{x > -12}$
24.	$-\frac{2}{6}x < 2$	$\boldsymbol{x > -6}$
25.	$-\frac{3}{6}x < 3$	$\boldsymbol{x > -6}$
26.	$-\frac{4}{6}x < 4$	$\boldsymbol{x > -6}$
27.	$3x + 3 < 6$	$\boldsymbol{x < 1}$
28.	$3x + 4 < 7$	$\boldsymbol{x < 1}$
29.	$3x + 5 < 8$	$\boldsymbol{x < 1}$
30.	$3x - 1 > 5$	$\boldsymbol{x > 2}$
31.	$3x - 4 > 5$	$\boldsymbol{x > 3}$
32.	$3x - 7 > 5$	$\boldsymbol{x > 4}$
33.	$l - 3x + 1 < 7$	$\boldsymbol{x > -2}$
34.	$-3x + 2 < -7$	$\boldsymbol{x > 3}$
35.	$-3x + 3 < 9$	$\boldsymbol{x > -2}$
36.	$-4x + 1 < -11$	$\boldsymbol{x > 3}$
37.	$-4x + 1 < -7$	$\boldsymbol{x > 2}$
38.	$-4x + 1 < -3$	$\boldsymbol{x > 1}$
39.	$3(x + 2) < 9$	$\boldsymbol{x < 1}$
40.	$4(x + 2) < 12$	$\boldsymbol{x < 1}$
41.	$5(x + 2) > 15$	$\boldsymbol{x > 1}$
42.	$-2(x + 1) < 4$	$\boldsymbol{x > -3}$
43.	$-3(2x - 1) < -9$	$\boldsymbol{x > 2}$
44.	$-5(4x + 1) < 15$	$\boldsymbol{x > -1}$