# **Unit 4 Lesson 5: Efficiently Solving Inequalities**

## 1 Lots of Negatives (Warm up)

#### **Student Task Statement**

Here is an inequality:  $-x \ge -4$ .

- 1. Predict what you think the solutions on the number line will look like.
- 2. Select **all** the values that are solutions to  $-x \ge -4$ :
  - a. 3
  - b. -3
  - c. 4
  - d. -4
  - e. 4.001
  - f. -4.001
- 3. Graph the solutions to the inequality on the number line:

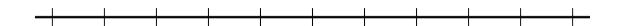
### 2 Inequalities with Tables

#### **Student Task Statement**

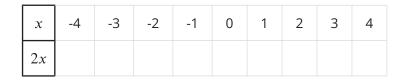
1. Let's investigate the inequality x - 3 > -2.

x	-4	-3	-2	-1	0	1	2	3	4
x-3	-7		-5				-1		1

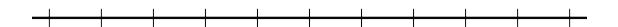
- a. Complete the table.
- b. For which values of x is it true that x 3 = -2?
- c. For which values of x is it true that x 3 > -2?
- d. Graph the solutions to x 3 > -2 on the number line:



- 2. Here is an inequality: 2x < 6.
  - a. Predict which values of x will make the inequality 2x < 6 true.
  - b. Complete the table. Does it match your prediction?



c. Graph the solutions to 2x < 6 on the number line:



- 3. Here is an inequality: -2x < 6.
  - a. Predict which values of x will make the inequality -2x < 6 true.
  - b. Complete the table. Does it match your prediction?

х	-4	-3	-2	-1	0	1	2	3	4
-2 <i>x</i>									

c. Graph the solutions to -2x < 6 on the number line:



d. How are the solutions to 2x < 6 different from the solutions to -2x < 6?

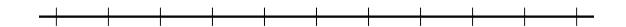
### 3 Which Side are the Solutions?

### **Student Task Statement**

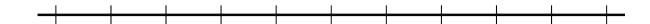
- 1. Let's investigate  $-4x + 5 \ge 25$ .
  - a. Solve -4x + 5 = 25.
  - b. Is  $-4x + 5 \ge 25$  true when x is 0? What about when x is 7? What about when x is -7?
  - c. Graph the solutions to  $-4x + 5 \ge 25$  on the number line.



- 2. Let's investigate  $\frac{4}{3}x + 3 < \frac{23}{3}$ .
  - a. Solve  $\frac{4}{3}x + 3 = \frac{23}{3}$ .
  - b. Is  $\frac{4}{3}x + 3 < \frac{23}{3}$  true when *x* is 0?
  - c. Graph the solutions to  $\frac{4}{3}x + 3 < \frac{23}{3}$  on the number line.



3. Solve the inequality 3(x + 4) > 17.4 and graph the solutions on the number line.



4. Solve the inequality -3  $\left(x-\frac{4}{3}\right) \le 6$  and graph the solutions on the number line.

