

6.3

Solve Multi-Step Inequalities

Goal • Solve multi-step inequalities.

Your Notes

Example 1 Solve a two-step inequality

Solve $4x + 6 \geq 54$. Graph your solution.

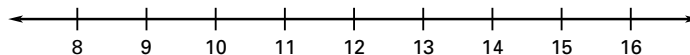
Solution

$$4x + 6 \geq 54 \quad \text{Write original inequality.}$$

$$4x \geq 48 \quad \text{Subtract } \underline{\hspace{1cm}} \text{ from each side.}$$

$$\underline{\hspace{1cm}} \quad \text{Divide each side by } \underline{\hspace{1cm}}.$$

The solutions are all real numbers $\underline{\hspace{2cm}}$.



Example 2 Solve a multi-step inequality

Solve $-\frac{1}{3}(x + 21) < 2$.

Solution

$$-\frac{1}{3}(x + 21) < 2 \quad \text{Write original inequality.}$$

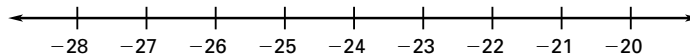
$$-\frac{1}{3}x - \underline{\hspace{1cm}} < 2 \quad \text{Distributive property}$$

$$-\frac{1}{3}x < \underline{\hspace{1cm}} \quad \text{Add } \underline{\hspace{1cm}} \text{ to each side.}$$

$$\underline{\hspace{1cm}} \quad \text{Multiply each side by } \underline{\hspace{1cm}}.$$

the inequality symbol.

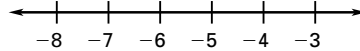
The solutions are all real numbers $\underline{\hspace{2cm}}$.



Your Notes

✓ Checkpoint Solve the inequality. Graph your solution.

1. $-5w - 2 \geq 23$



2. $2(y - 2.2) > 0$



Example 3 Identify the number of solutions of an inequality

Solve the inequality, if possible.

a. $8x + 3 > 2(4x + 1)$

b. $3(8b - 1) \geq 24b - 4$

Solution

a. $8x + 3 > 2(4x + 1)$

Write original inequality.

$8x + 3 > \underline{\hspace{2cm}}$

Distributive property

$\underline{\hspace{2cm}}$

Subtract $\underline{\hspace{1cm}}$ from each side.

$\underline{\hspace{2cm}}$ are solutions because $\underline{\hspace{2cm}}$ is $\underline{\hspace{1cm}}$.

b. $3(8b - 1) \geq 24b - 4$

Write original inequality.

$\underline{\hspace{2cm}} \geq 24b - 4$

Distributive property

$\underline{\hspace{2cm}}$

Subtract $\underline{\hspace{1cm}}$ from each side.

There are $\underline{\hspace{2cm}}$ because $\underline{\hspace{2cm}}$ is $\underline{\hspace{1cm}}$.

Your Notes

Checkpoint Solve the inequality, if possible.

<p>3. $18 + 4w \geq \frac{1}{2}(8w + 36)$</p>	<p>4. $-2(3z - 1) < 1 - 6z$</p>
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Example 4 Solve a multi-step problem

Cell Phone Your cell phone plan is \$35 a month for 1000 minutes. You are charged \$.25 per minute for any additional minutes. What are the possible numbers of additional minutes you can use if you want to spend no more than \$50 on your monthly cell phone bill?

Solution

The amount spent on the monthly plan plus additional minutes must be less than or equal to your monthly budget. Let m be the number of additional minutes that you use.

Price per minute (dollars/min)	•	Number of minutes (minutes)	+	Monthly fee (dollars)	≤	Monthly budget (dollars)
_____		m		_____		_____
						\$ _____
		m				\$ _____
		m				\$ _____

Write inequality.

Subtract _____ from each side.

Divide each side by _____.

You can use an additional _____ per month to keep within your monthly cell phone budget.

Homework