

# KEY POINTS

## Section 3.2 Solving Inequalities

- Inequality notation
- Solving inequalities

# Warm - Up

Section 3.2  
Solving  
Inequalities

$$\frac{3}{2x-1} + \frac{5}{3-2x} = 0$$

# Discussion

Section 3.2  
Solving  
Inequalities

What do you know about inequalities?

Not always equal

Used to identify domain and range

$>$   $<$   $\geq$   $\leq$

# Discussion

Section 3.2  
**Solving  
Inequalities**

$<$  less than, no more than

$>$  greater than, at least, more than

$\leq$  less than or equal to

$\geq$  greater than or equal to

# Examples

## Section 3.2

### Solving Inequalities

Write an inequality for each situation.

a.) Her grade  $G$  must be greater than or equal to 70 and less than 75 in order to receive a C in the course.

$$G \geq 70 \quad G < 75 \quad 70 \leq G < 75$$

b.) The minimum speed on the highway,  $s$ , is 35 mph and the maximum speed is 65 mph.

$$35 \leq s \leq 65 \quad 35 \leq s < 65$$

c.) The basketball team only considers players,  $P$ , who are at least 6 feet tall.

$$P \geq 6$$

# Examples

## Section 3.2

### Solving Inequalities

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When we solve inequalities, we solve them the same way that we solve equations. This means we reduce inequalities to simpler inequalities having the same solutions.

Solve the equation:  $4x + 5 = 29$

$$\begin{array}{r} -5 \quad -5 \\ \hline 4x = 24 \\ \hline \frac{4}{4} \quad \frac{4}{4} \\ \hline x = 6 \end{array}$$

Solve the inequality:  $4x + 5 < 29$

$$\begin{array}{r} -5 \quad -5 \\ \hline 4x < 24 \\ \hline \frac{4}{4} \quad \frac{4}{4} \\ \hline x < 6 \end{array}$$

# Warm-Up

Section 3.2  
Solving  
Inequalities

Solve:  $6x - 9 < 27$

$$\begin{array}{rcl} & +9 & +9 \\ 6x & < & 36 \\ \hline 6 & & 6 \\ x & < & 6 \end{array}$$

# Practice

Section 3.2  
Solving  
Inequalities

Solve the inequality:  $-3x + 9 < 33$

$$\begin{array}{r} -9 \quad -9 \\ -3x < 24 \\ \hline -3 \quad -3 \\ x > -8 \end{array}$$



# Examples

## Section 3.2 Solving Inequalities

When we are working with inequalities there is a special rule that we need to follow when it comes to multiplication and division.

IF YOU HAVE TO MULTIPLY OR DIVIDE BY A NEGATIVE NUMBER, WE MUST REVERSE THE DIRECTION OF THE INEQUALITY TO KEEP THE STATEMENT TRUE.

$$\begin{array}{lcl} 6 - (-2) < 8 & 6 - x < 8 & \\ b + 2 < 8 & \begin{array}{r} -6 \quad -6 \\ \hline -x < 2 \\ \hline -1 \quad -1 \end{array} & \\ b - (-1) < 8 & & \\ b + 1 < 8 & & x > -2 \\ 7 < 8 & & \end{array}$$

# Examples

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Inequalities

$$\begin{array}{r} 7 - 2x > 21 \\ -7 \quad -7 \\ \hline -2x > 14 \\ \hline -2 \quad -2 \\ x < -7 \end{array}$$

# Examples

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Inequalities

$$-3(x + 4) + 6 > 10$$

$$\underline{-6 \quad -6}$$

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

$$-3x - 12 > 4$$

$$\underline{+12 \quad +12}$$

$$-3x > 16$$

$$\underline{-3 \quad -3}$$

$$x < -\frac{16}{3}$$

# Examples

## Section 3.2 Solving Inequalities

$$\begin{array}{r} 4 - (3x + 2) \geq 6 + x \\ -4 \qquad -4 \end{array}$$

$$\hline -(3x+2) \geq 2+x$$

$$\begin{array}{r} -3x-2 \geq 2+x \\ +2 \quad +2 \end{array}$$

$$\hline \begin{array}{r} -3x \geq 4+x \\ -x \quad -x \end{array}$$

$$\hline \begin{array}{r} -4x \geq 4 \\ -4 \quad -4 \end{array}$$

$$\textcircled{x \leq -1}$$

# Homework

Section 3.2  
**Solving**  
**Inequalities**

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