

p. 205 W-UPS

74. Which inequality has the same solutions as $n > 5$?
 A. $n < -5$ B. $n > 5$ C. $5 < n$ D. $-n > -5$

75. What is the least whole-number solution of $k \geq -5$?
 F. -8 G. -4 H. 0 J. 1
 $-5, -4, -3, -2, -1, 0, 1$

76. Employees must work at least 20 years in a company in order to receive full benefits upon retirement. Which inequality or graph does NOT describe this situation?
 A. $y \geq 20$ B. $y > 20$ C. $20 \leq y$ D.

77. Which value makes the inequality $x^2 \geq x$ false?
 F. 1 G. 0 H. $\frac{1}{4}$ J. 1
 $0^2 \geq 0$
 $(\frac{1}{4})^2 \geq \frac{1}{4}$
 $\frac{1}{16} \geq \frac{1}{4}$
 $.0625 \geq .25$

Oct 8-4:23 AM

78. Fire codes require that no more than 150 persons occupy a conference room. Which graph includes a room count in possible violation of the fire codes?

A.

B.

C.

D.

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Lesson 4-2 Day 30 ^{10/8}
 Solving Inequalities Using Addition and Subtraction

Lesson Objectives ▼ Use addition to solve inequalities ▼ Use subtraction to solve inequalities	NAEP 2005 Strand: Algebra Topic: Equations and Inequalities Local Standards:
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Vocabulary and Key Concepts

Addition Property of Inequality
 For every real number $a, b,$ and $c,$
 if $a > b,$ then $a+c > b+c$ if $a < b,$ then $a+c < b+c$
 Examples $3 > 1,$ so $3+2 > 1+2$ $-5 < 4,$ so $-5+2 < 4+2$
 $-3 < 6$
 This property is also true for \geq and $\leq.$

Subtraction Property of Inequality
 For every real number $a, b,$ and $c,$
 if $a > b,$ then $a-c > b-c$ if $a < b,$ then $a-c < b-c$
 Examples $3 > -1,$ so $3-2 > -1-2$ $-5 < 4,$ so $-5-2 < 4-2$
 $-7 < 2$
 This property is also true for \geq and $\leq.$

Equivalent Inequalities are inequalities with the same solutions
 $x+4 > 7$ is the same as $x > 3$

Oct 8-4:23 AM

Examples

1 Using the Addition Property of Inequality Solve $8 \geq d - 2$. Graph and check your solution.

$8 + 2 \geq d - 2 + 2$ Add \square to each side.
 $10 \geq d$, or $d \leq 10$ Simplify.

$d - 2 \leq 8$
 $+2 \quad +2$
 $d \leq 10$

Check $8 = d - 2$
 $8 \geq 10 - 2$
 $8 = 8 \checkmark$
 $8 \geq d - 2$
 $8 \geq 9 - 2$
 $8 \geq 7 \checkmark$

Check the computation. Substitute 10 for d .

Check the direction of the inequality. Substitute 9 for d .

Oct 8-4:23 AM

2 Using the Subtraction Property of Inequality To receive a B in your literature class, you must earn more than 350 points of reading credits. Last week you earned 120 points. This week you earned 90 points. How many more points must you earn to receive a B?

Relate \square points earned plus \square points needed is more than \square points required

Define Let p = the number of points needed.

Write $120 + 90 + p > 350$

$210 + p > 350$

$210 + p - 210 > 350 - 210$ Subtract 210 from each side.

$p > 140$ Simplify.

You must earn 141 more points.

Oct 8-4:24 AM

Quick Check

1. a. Solve $m - 6 > -4$. Graph your solution.

$m - 6 > -4$
 $+6 \quad +6$
 $m > 2$

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b. Solve $n - 7 \leq -2$. Graph and check your solution.

$n - 7 \leq -2$
 $+7 \quad +7$
 $n \leq 5$

• $\leq \geq$
 o $> <$

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2. a. Solve $t + 3 \geq 8$. Graph and check your solution.

$$\begin{array}{r} t + 3 \geq 8 \\ -3 \quad -3 \\ \hline t \geq 5 \end{array}$$

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b. Your baseball team has a goal to collect at least 160 blankets for a shelter. Team members brought 42 blankets on Monday and 65 blankets on Wednesday. How many blankets must the team donate on Friday to meet or exceed their goal?

$$42 + 65 + b \geq 160$$

$$\begin{array}{r} 107 + b \geq 160 \\ -107 \quad -107 \\ \hline b \geq 53 \end{array}$$

53 blankets or more must be donated

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<p>Lesson 4-3</p> <p>Lesson Objectives</p> <ul style="list-style-type: none"> ▼ Use multiplication to solve Inequalities ▼ Use division to solve Inequalities 	<p style="text-align: right;">Solving Inequalities Using Multiplication and Division</p> <p>NAEP 2005 Strand: Algebra Topic: Equations and Inequalities</p> <p>Local Standards: _____</p>
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Multiplication Property of Inequality

For every real number a and b , and for $c > 0$,
 if $a > b$, then $ac > bc$; if $a < b$, then $ac < bc$. c is a positive #

Examples
 $4 > -1$, so $4(5) > -1(5)$. $-6 < 3$, so $-6(5) < 3(5)$

For every real number a and b , and for $c < 0$,
 if $a > b$, then $ac < bc$; if $a < b$, then $ac > bc$. c is a negative #

Examples
 $4 > -1$, so $4(-2) < -1(-2)$. $-6 < 3$, so $-6(-2) > 3(-2)$

This property is also true for \geq and \leq .

$-8 > 2$
 $-8 < 2$

$5 > 4$
 $5(-5) > 4(-5)$
 $-25 > -20$
 $-25 < -20$

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Division Property of Inequality Positive

For every real number a and b , and for $c > 0$,
 if $a > b$, then $\frac{a}{c} > \frac{b}{c}$; if $a < b$, then $\frac{a}{c} < \frac{b}{c}$.

Examples
 $6 > 4$, so $\frac{6}{3} > \frac{4}{3}$; $2 < 8$, so $\frac{2}{3} < \frac{8}{3}$.

For every real number a and b , and for $c < 0$,
 if $a > b$, then $\frac{a}{c} < \frac{b}{c}$; if $a < b$, then $\frac{a}{c} > \frac{b}{c}$.

Examples
 $6 > 4$, so $\frac{6}{-3} < \frac{4}{-3}$; $2 < 8$, so $\frac{2}{-3} > \frac{8}{-3}$.

This property is also true for \geq and \leq .
 $-3 < -2$ $-1 > -4$

★ If you \div or multiply both sides by a negative #, Flip your inequality sign!!

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Examples

1 **Multiplying to Solve an Inequality** Solve $3 \leq -\frac{2}{3}x$. Graph and check the solutions

$-\frac{5}{3} \cdot \frac{3}{5} x \geq 3 \cdot \left(\frac{-5}{3}\right)$
 $x \leq -5$

rewrite so the letter is on the left

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2 **Dividing to Solve an Inequality** Solve $-4c < 24$. Graph the solutions.

$-\frac{-4c}{-4} > \frac{24}{-4}$ Divide each side by -4 . Reverse the inequality symbol.
 $c > -6$ Simplify.

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3 **Applying Inequalities** Your family budgets \$160 to spend on fuel for a trip. How many times can they fill the car's gas tank if it costs \$25 each time?

Relate cost per tank, times, number of tanks, is at most, total fuel budget

Define Let t = the number of tanks of gas

Write $25t \leq 160$

$\frac{25t}{25} \leq \frac{160}{25}$ Divide each side by 25 .
 $t \leq 6.4$ Simplify.

Your family can fill the car's gas tank at most 6 times.

Oct 8-4:26 AM

Quick Check
Solve each inequality. Graph and check your solutions.

1. a. $\frac{b}{4} > \frac{1}{2}$

$$\cancel{\frac{b}{4}} > \frac{1}{2} \cdot 4$$

$$b > 2$$

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b. $\frac{y}{0.5} \leq -3$

$$\cancel{\frac{y}{0.5}} \leq -3(0.5)$$

$$y \leq -1.5$$

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c. $\frac{k}{4} > -1$

$$\cancel{\frac{k}{4}} > -1 \left(\frac{4}{1} \right)$$

$$k < 4$$

$$\frac{-k}{-1} > \frac{-4}{-1}$$

$$k < 4$$

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a. $-t < \frac{1}{2}$

$$\cancel{-t} < \frac{1}{-1}$$

$$t > -\frac{1}{2}$$

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2 a. $-3w \geq 12$

$$\frac{-3w}{-3} \geq \frac{12}{-3}$$

$$w \leq -4$$

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b. $0.6 > -0.2n$

$$\frac{-0.2n}{-0.2} < \frac{0.6}{-0.2}$$

$$n > -3$$

$-3 < n$

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3. Students in the school band are selling calendars. They earn \$.40 on each calendar they sell. Their goal is to earn more than \$327. Write and solve an inequality to find the least number of calendars they can sell and still reach their goal.

$$.40c > 327$$

$$c > 818$$

Sell 819 or more

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HW: Wkbk p.305 - 4.2 Wkst (2, 6, 10, 14, 18, 22, 24, 28, 32, 33, 34)
 & p.307 - 4.3 Wkst (1st column, omit 23-25)

do on a separate sheet of
 paper
 write out
 problem +
 show work

Name _____
 Date /B _____
 4.2/4.3 Wkst

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