

Jared went shopping. He bought one mirror and two lamps. Though he wanted to buy four baskets, he had only enough money left in his wallet to buy three. What could be the amount Jared had in his wallet before he went shopping? Explain.

(Do not consider taxes)

\$ Mirror \$ 39.99	Basket \$ 11.99	LAMP \$ 22.46
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$$39.99 \times 1 = 39.99$$

$$22.46 \times 2 = 44.92$$

$$11.99 \times 3 = 35.97$$

3 Baskets

$$\text{Total} = 120.88$$

4 Baskets

$$132.87$$

Jared went shopping. He bought one mirror and two lamps. Though he wanted to buy four baskets, he had only enough money left in his wallet to buy three. What could be the amount Jared had in his wallet before he went shopping? Explain.

(Do not consider Taxes)

Mirror	Basket	LAMP
\$39.99	\$11.99	\$22.46

$$\underline{\geq 120.88}$$

$$\leq 132.87$$

10/10/07 Objective: TSWBAT solve one step
inequalities using multiplication or division

$$4 < 8$$

Lets Play

$$\frac{(2)}{\quad} \quad \frac{(2)}{\quad}$$

$$\frac{8}{4} < \frac{16}{4}$$

$$2 < 4 \text{ True}$$

When you multiply or divide by a positive value the inequality remains true

$$2 < 8$$

$$\frac{(-4)}{\quad} \quad \frac{(-4)}{\quad}$$

$$-8 < -32 \text{ Not True}$$

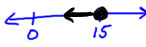


$$-8 > -32$$

When you multiply or divide both sides of an inequality by a negative value you must reverse the inequality symbol to make it true

Rule: When you multiply both sides of an inequality by a positive value the inequality remains true. When you multiply or divide both sides of an inequality by a negative value, you must reverse the inequality symbol to make the inequality true


$$\textcircled{1} \frac{x}{3} \leq 5 \quad (3)$$

$$x \leq 15$$


$$\textcircled{2} \frac{x}{-2} \geq 16 \quad (-2)$$

$$x \leq -32$$


Reverse the inequality symbol




$$\textcircled{3} \frac{-4}{7}x \leq \frac{20}{-4}$$

$$x \geq -5$$

Reverse the inequality symbol




$$\textcircled{4} \frac{2}{3}x \geq \frac{-12}{2}$$

$$x \geq -6$$


$$\textcircled{5} \frac{b}{-4} \geq 1 \quad (-4)$$

$$b \leq -4$$


Reverse the inequality symbol



$$\textcircled{6} -4 > \frac{x}{-2} \quad (-2)$$

$$8 < x$$


Reverse the inequality symbol



$$\textcircled{7} \frac{-2}{-2}p \geq \frac{34}{-2}$$

$$p \leq -17$$


Reverse the inequality symbol



$$\textcircled{8} \frac{-3a}{-3} \leq \frac{-12}{-3}$$

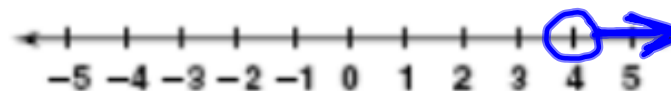
$$a \geq 4$$

Reverse the inequality symbol

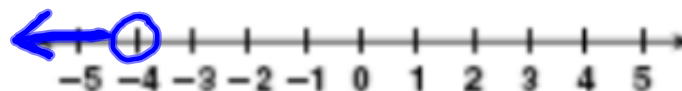


Solve each inequality and graph the solutions.

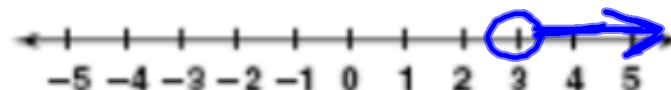
1. $\frac{2a}{2} > \frac{8}{2}$ $a > 4$



2. $\frac{12}{-3} < \frac{-3r}{-3}$ $-4 > r$



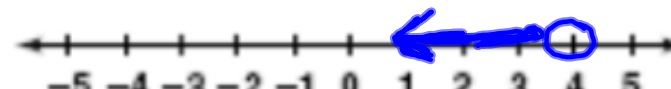
3. $\frac{1}{3}n > 1$ (3) $n > 3$



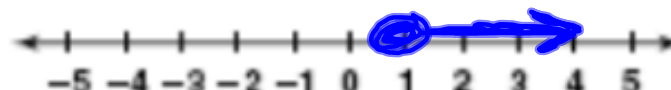
4. $\frac{12}{6} \geq \frac{6s}{6}$ $2 \geq s$



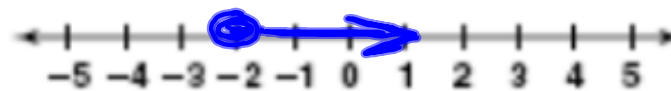
5. $\frac{m}{4} < 1$ (4) $m < 4$



6. $\frac{5g}{5} \geq \frac{5}{5}$ $g \geq 1$



7. $\frac{-4x}{-4} \leq \frac{8}{-4}$ $x \geq -2$



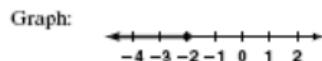
Reteaching 2-7

Solving Inequalities by Multiplying or Dividing

To help solve an inequality, you can divide or multiply each side by the same number. However, if the number is a negative number, you must also reverse the direction of the inequality.

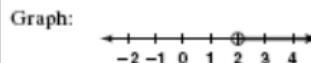
Solve: $-3y \geq 6$. Graph the solution.
 $-3y \geq 6$

Divide each side by 23.
 $\frac{-3y}{-3} \leq \frac{6}{-3}$ ← Reverse the direction of the inequality.
 $y \leq -2$ ← Simplify.



Solve: $\frac{a}{2} > 1$. Graph the solution.
 $\frac{a}{2} > 1$

Multiply each side by 2.
 $2\left(\frac{a}{2}\right) > 1(2)$ ← Multiply each side by 2.
 $a > 2$ ← Simplify.



Solve each inequality and graph the solutions.

1. $2a > 8$ _____

2. $12 < -3r$ _____

3. $\frac{1}{3}n > 1$ _____

4. $12 \geq 6s$ _____

5. $\frac{m}{4} < 1$ _____

6. $5q \geq 5$ _____

7. $-4x \leq 8$ _____

8. What is the least whole number solution of $-9x < -27$?

9. Donna sings on average $2\frac{1}{2}$ minutes per song. If a cassette holds 20 minutes of songs, what is the greatest number of songs she can record on a cassette?

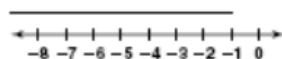
HW. PP 100-101, 1-25, 28, 30

Practice 2-7

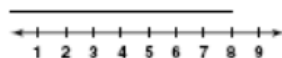
Solving Inequalities by Multiplying and Dividing

Solve each inequality and graph the solutions.

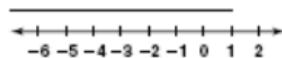
1. $-5m < 20$



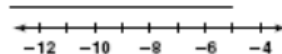
3. $4v > 16$



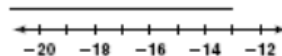
5. $5a > -10$



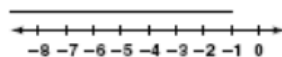
7. $\frac{c}{-6} > 1$



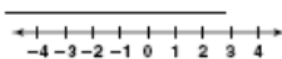
9. $5d < -75$



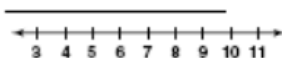
11. $0.5n \geq -2.5$



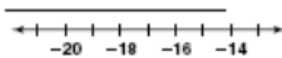
2. $\frac{j}{6} \leq 0$



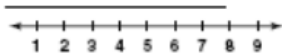
4. $\frac{b}{2} < 4$



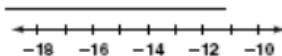
6. $\frac{c}{-3} \geq 6$



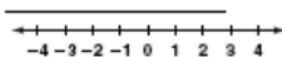
8. $-4i \leq -16$



10. $\frac{d}{12} < -1$



12. $\frac{p}{0.2} \leq 10$



Write an inequality for each problem. Solve the inequality. Then give the solution to the problem.

13. Dom wants to buy 5 baseballs. He has \$20. What is the most each baseball can cost?

14. A typing service charges \$5.00 per page. Mrs. Garza does not want to spend more than \$50 for the typing. What is the maximum number of pages she can have typed?

15. The tables at a restaurant can each seat 8 people. A dinner at the restaurant will be attended by 125 people. How many tables does the restaurant need in order for every person at the dinner to have a seat?

Enrichment 2-7

Solving Inequalities by Multiplying or Dividing

Decision Making

You have made scores of 75 and 82 on your first two tests in Spanish. What scores can you get on your next test if you want to maintain an average of at least 80?

1. Circle the test scores you have already made.
2. What average do you want to maintain?

3. Which operations do you use to find an average?

4. Let x represent the score on your next test. Which inequality represents the average of the test scores?

a. $\frac{x + 75 + 82}{3} > 80$

b. $\frac{x + 75 + 82}{3} \geq 80$

c. $\frac{x + 75 + 82}{3} \leq 80$

5. Solve the inequality chosen in Exercise 4.

6. What score can you get on your next test to maintain an average of at least 80?

7. You know that 75 is 5 less than the desired average and 82 is 2 greater than the desired average. How can this help you find the scores you need to get on your next test using mental math?

8. Suppose you get an 81 on the test. Your teacher tells you that there will be one more test in the term. Let z represent the score on your last test. Rewrite the inequality from Exercise 4 to reflect the situation.

9. Your quiz scores are 85 and 91 in Social Studies. If you want to maintain an average of at least 90, what scores can you get on your next quiz?

2-7 • Guided Problem Solving

PS Student Page 101, Exercise 32:

Jobs Your brother wants a new multi-disc DVD player. The lowest price he can find is \$182.89. He earns \$6.85 per hour working at a theater. How many hours will he need to work to earn enough money for the player?

Read and Understand

1. Circle the information needed to solve the problem.
2. What are you being asked to find?

Plan and Solve

3. How would you calculate the amount your brother earns in h hours?

4. Write an inequality with what you know about the lowest price of the DVD player and how much your brother can earn in h hours.

5. What do you need to do to solve for the variable h ? Solve the inequality.

Look Back and Check

6. Could your brother work only 26 hours to pay for the DVD player? Could he work 27 hours to pay for the DVD player?

Solve Another Problem

7. A construction site foreman orders pizza for her crew. There are 9 people on the crew and she expects each person to eat at least four slices of pizza. At least how many large pizzas should she order if each pizza is cut into 8 slices? (Let p represent the number of pizzas.)

A Practice by Example

Solve each inequality and graph the solutions.

Example 1
(page 98)

1. $\frac{d}{3} > 4$

2. $-4 < \frac{r}{5}$

3. $\frac{v}{2} > 0$

4. $\frac{c}{19} \geq 30$

5. $-18 \geq \frac{x}{2}$

6. $\frac{n}{15} \leq 0.5$

Example 2
(page 98)

7. $2b < 8$

8. $5c < 10$



9. $7p \geq 49$

10. $12 < 3x$

11. $4y \leq -20$

12. $6w \leq -54$

Write and solve an inequality to answer each question.

-  13. **Budgeting** The luncheon special at Little Jimmy's costs \$4.89. The math club has \$23.50 in its account. What is the greatest number of luncheon specials they can buy with the money in their luncheon account?
-  14. **Carpentry** A CD case is 0.375 in. thick. You can build a shelf that is at most 36 in. long. How many CD cases can you fit on the shelf?

Example 3
(page 100)

Solve each inequality and graph the solutions. Exercise 15 has been started for you.

15. $\frac{r}{2} \leq 3$

16. $\frac{m}{2} > 0$

17. $\frac{z}{12} \leq -8$

$$-2\left(\frac{r}{2}\right) \geq -2(3)$$

18. $-20 \geq \frac{b}{7}$

19. $6 < \frac{x}{2}$

20. $\frac{y}{2} > 0.1$

Example 4
(page 100)

21. $-6x \leq 24$

22. $-15s \leq 30$

23. $-2w < -14$

24. $-4t > -20$

25. $-15 > -3q$

26. $27 \geq -0.9r$


B Apply Your Skills27. What is the least integer solution of $12x > -12$?28. **Error Analysis** A student solved $4t > -16$ as shown. What error did the student make?29. **Reasoning** Which number is not a solution of either $x < -3$ or $-x < 3$?30. **Writing in Math** Explain how solving $5x < 20$ is different from solving $-5x < 20$.

$$4t > -16$$


$$\frac{4t}{4} < \frac{-16}{4}$$

$$t < -4$$

Write an inequality for each problem. Solve the inequality. Then give the solution to the problem.

-  31. **Day Care** In Virginia, for every group of 5 two-year-olds in day care there must be at least 1 teacher. At one day-care center, 19 two-year-olds are signed up for next year's class. At least how many teachers must the center have to teach two-year-olds next year?

32. **Jobs** Your brother wants a new multi-disc DVD player. The lowest price he can find is \$182.89. He earns \$6.85/h working at a theater. How many hours will he need to work to earn enough money for the player?

 33. **Field Trip** Some buses can seat 48 people. There are 157 students and 8 teachers going on a trip. How many buses should the school reserve?

Solve each inequality.

34. $-2.5m \leq 40$

35. $4.5 > -0.9w$

36. $\frac{r}{0.25} \leq -16$

37. $18 < \frac{w}{200}$

38. $32v < -352$

39. $1,200 > 150m$

 **Challenge**

What values of a and b will make each inequality true?

40. $ab > 0$

41. $ab < 0$

42. $a^2b > 0$

43. $\frac{a}{b} > 0$

$4t > -16$

$\frac{4t}{4} < \frac{-16}{4}$

$t < -4$

44. **Reasoning** A student solved $\frac{a}{b} > 2$ for a by multiplying each side by b .

The student got the solution $a > 2b$. Is the student's answer correct for $b > 0$? Is it correct for $b = 0$? For $b < 0$? Explain.

45. **Stretch Your Thinking** Change the operation in one place in the expression $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9$ to make the value 100.