

Attention:

Your # 5 is shown on the  
last page.



Study Guide due Mon, 12/11  
Test on Tues, 12/13.

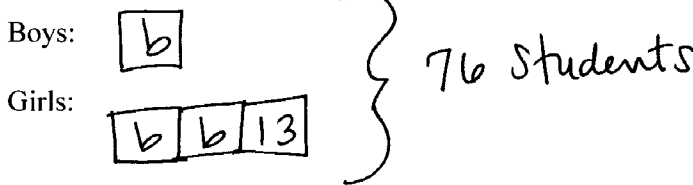
Study Guide Chapter 7

Math 7

1. There are 76 students in the Breezewood Middle School chorus. The number of girls in the chorus is 13 more than twice the number of boys.

first

a. Draw a picture that models the situation. Label the unknown parts with variables and the known parts with their values.



fourth

b. Use your picture to determine the number of boys and the number of girls that belong to the chorus. Show your calculations.

girls =  $2b + 13$   
 $2(21) + 13$   
 $42 + 13$   
 $55$

$$\begin{array}{r|l} 3b + 13 & = 76 \\ -13 & -13 \\ \hline 3b & = 63 \\ \frac{3b}{3} & = \frac{63}{3} \\ b & = 21 \end{array}$$

There are 21 boys and 55 girls.  
 $55 + 21 = 76$ .

second

c. Write an expression for the number of boys and an expression for the number of girls using the variable  $b$  to represent the number of boys.

Boys:  $b$

Girls:  $2b + 13$

third

d. Write an equation to represent this situation.

$b + 2b + 13 = 76$  (labeled "acceptable")

$3b + 13 = 76$  (labeled "preferred")

2. Use the pan balance to answer each question.



a. What will balance 1 rectangle? Explain your strategy.  $1 \text{ rectangle} = 4 \text{ squares}$ .  
I crossed out (subtracted) 5 squares from each side. Then, I divided the remaining # of squares by the # of rectangles.

b. Use symbols to rewrite the representation shown on the balance. Let  $\blacksquare = x$  and  $\square = 1$  unit. Then, determine what balances  $x$ . (Solve for  $x$ )

$$\begin{array}{r|l} 2x + 5 & = 13 \\ -5 & -5 \\ \hline 2x & = 8 \\ \frac{2x}{2} & = \frac{8}{2} \\ x & = 4 \end{array}$$

3. Write a sentence to describe how to apply inverse operations to solve the equation. Then solve and verify your solution.

add 5, then divide 8.

$$\begin{array}{r|l} 8x-5 & = -37 \\ +5 & +5 \\ \hline 8x & = -32 \\ 8 & 8 \\ \hline x & = -4 \end{array}$$

$$\begin{array}{r|l} 8x-5 & = -37 \\ 8(-4)-5 & \stackrel{?}{=} -37 \\ -32-5 & \stackrel{?}{=} -37 \\ -37 & = -37 \checkmark \end{array}$$

Choose 1 method:

Distribute first - method 1

4. Solve and verify

$$\begin{array}{r|l} 8(3x-4) & = 16 \\ 8(3x)-8(4) & = 16 \\ 24x-32 & = 16 \\ +32 & +32 \\ \hline 24x & = 48 \\ 24 & 24 \\ \hline x & = 2 \end{array}$$

$$\begin{array}{r|l} 8(3x-4) & = 16 \\ 8(3 \cdot 2-4) & \stackrel{?}{=} 16 \\ 8(6-4) & \stackrel{?}{=} 16 \\ 8(2) & \stackrel{?}{=} 16 \\ 16 & = 16 \checkmark \end{array}$$

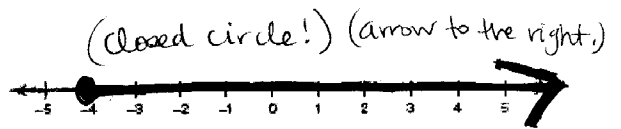
Faster Method?

$$\begin{array}{r|l} 8(3x-4) & = 16 \\ 8 & 8 \\ \hline 3x-4 & = 2 \\ +4 & +4 \\ \hline 3x & = 6 \\ 3 & 3 \\ \hline x & = 2 \end{array}$$

$$\begin{array}{r|l} 8(3x-4) & = 16 \\ 8(3 \cdot 2-4) & \stackrel{?}{=} 16 \\ 8(6-4) & \stackrel{?}{=} 16 \\ 8(2) & \stackrel{?}{=} 16 \\ 16 & = 16 \checkmark \end{array}$$

★ The extra #5 is on the next page. ★

5. Solve and verify. Then, graph the solution on a number line.



$$\begin{array}{r|l} 3x+7 & \geq -5 \\ -7 & -7 \\ \hline 3x & \geq -12 \\ 3 & 3 \\ \hline x & \geq -4 \end{array}$$

} solve

$$\begin{array}{r|l} 3x+7 & \geq -5 \\ 3(-4)+7 & \stackrel{?}{\geq} -5 \\ -12+7 & \stackrel{?}{\geq} -5 \\ -5 & \stackrel{?}{\geq} -5 \checkmark \end{array}$$

} verify

- ① Write an equation to represent each situation.
- ② Define your variables, solve the equation, and verify your solution. ③
- ④

6. Ms. Moderelli charges her piano students \$40 per lesson plus a semester recital fee of \$55. How many lessons did Jerry take if he paid a total of \$695 for lessons this semester?

40 per lesson plus 55 total

$$\begin{array}{r|l} 40l + 55 & = 695 \\ -55 & -55 \\ \hline 40l & = 640 \\ 40 & 40 \\ \hline l & = 16 \end{array}$$

① write

③ solve

$$\begin{array}{r|l} 40l + 55 & = 695 \\ 40(16) + 55 & \stackrel{?}{=} 695 \\ 640 + 55 & \stackrel{?}{=} 695 \\ 695 & = 695 \checkmark \end{array}$$

④ verify

$$\begin{array}{r} 16 \\ \times 40 \\ \hline 640 \end{array}$$

② define: let  $l$  represent the number of lessons Jerry took, Jerry took 16 lessons this semester.

Write a sentence to describe how to apply inverse operations to solve the equation. Then solve and verify your solution.

$$8x - 5 = -37$$

4. Solve and verify

$$8(3x - 4) = 16$$

method 1

5. Solve and verify

$$\begin{array}{r} 4(2x-2) - 18 = -26 \\ +18 \quad +18 \\ \hline 4(2x-2) = (-8) \\ \div 4 \quad \div 4 \\ \hline 2x-2 = (-2) \\ +2 \quad +2 \\ \hline 2x = 0 \\ \div 2 \quad \div 2 \\ \hline x = 0 \end{array}$$

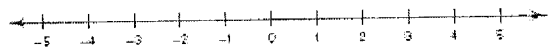
$$\begin{array}{l} 4(2x-2) - 18 = (-26) \\ 4(2 \cdot 0 - 2) - 18 \stackrel{?}{=} (-26) \\ 4(0 - 2) - 18 \stackrel{?}{=} (-26) \\ 4(-2) - 18 \stackrel{?}{=} (-26) \\ -8 - 18 \stackrel{?}{=} -26 \\ -26 = -26 \checkmark \end{array}$$

First, I'll add  
Then ~~distribute~~ divide

method 2: add then distribute...

$$\begin{array}{r} 4(2x-2) - 18 = (-26) \\ +18 \quad +18 \\ \hline 4(2x-2) = (-8) \\ 4(2x) - 4(2) = (-8) \\ 8x - 8 = (-8) \\ +8 \quad +8 \\ \hline 8x = 0 \\ \div 8 \quad \div 8 \\ \hline x = 0 \end{array}$$

6. Solve and verify. Then, graph the solution on a number line.



$$-3x + 7 \geq -5$$