

**Classwork**

## Opening Exercise

**State whether each number sentence is true or false. If the number sentence is false, explain why.**

**a.  $4 + 5 > 9$**

**b.  $3 \cdot 6 = 18$**

**c.  $32 > \frac{64}{4}$**

**d.  $78 - 15 < 68$**

**e.  $22 \geq 11 + 12$**

$$4 = M - 7$$

$$+ 7$$

$$+ 7$$

---

$$11 = M$$

① what is happening sub

② undo by addition

$$\frac{3}{5} \div \frac{7}{10} = \frac{3}{5} \cdot \frac{10}{7} = \frac{30}{35} = \frac{6}{7}$$

$$\left( \frac{6}{10} \right) \frac{3}{5} \div \frac{7}{10}$$

9/10

math-g6-m4-topic-g-lesson-26-student [Compatibility Mode] - Word

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**Classwork**

**Exercise 1**

Solve each equation. Use both tape diagrams and algebraic methods for each problem. Use substitution to check your answers.

Solving equations  
Algebraically

a.  $b + 9 = 15$

$$\begin{array}{r} b + 9 = 15 \\ -9 \quad -9 \\ \hline b = 6 \end{array}$$

15
----

b   9
-------

6   9
-------

① 1st thing  
Check and see what is happening to the variable and do inverse operation

② Ask yourself what is happening to the variable?

② On both sides

b.  $12 = 8 + c$

$$\text{a. } b + 9 = 15$$

$$\text{b. } 12 = 8 + c \quad \text{Model}$$

Algebraically

$$\begin{array}{r} 12 = 8 + c \\ -8 \quad -8 \\ \hline 4 = c \end{array}$$

① What is happening  
Ans. Addition

② Undo with subtraction  
from both side.

12	
----	--

c		8
---	--	---

4		8
---	--	---

**Exercise 2**

Given the equation  $d - 5 = 7$ :

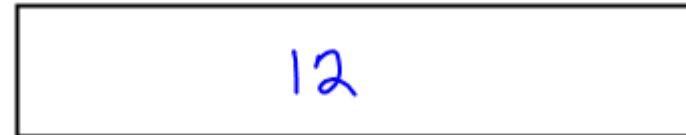
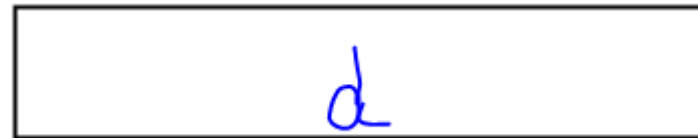
- a. Demonstrate how to solve the equation using tape diagrams.

$$\begin{array}{r} d - 5 = 7 \\ +5 \quad +5 \\ \hline d = 12 \end{array}$$

check:

$$12 - 5 = 7$$

True!



$$d = 12$$



$$\begin{array}{r}
 700 - \underline{d} = 665 \\
 + d \qquad \qquad + d \\
 \hline
 \begin{array}{r}
 \phantom{7}^6 \phantom{0}^9 \phantom{0}^{10} \\
 700 = 665 + d \\
 -665 \quad -665 \\
 \hline
 35 = d
 \end{array}
 \end{array}$$



**Classwork**

**Exercise 1**

Solve each equation. Use both tape diagrams and algebraic methods for each problem. Use substitution to check your answers.

a.  $b + 9 = 15$

15
----

b.  $12 = 8 + c$

b		9
---	--	---

b		9
---	--	---

Addition Model

① put one side of equation in 1 block.

② figure out amount of variable

Algebraically

being added      $b + 9 = 15$   
 undo by          $-9 \quad -9$   
 subtraction      $\hline$   
 on both          $b = 6$   
 side

Algebraically

zero pair

$12 = 8 + c$   
 $-8 \quad -8$   
 $\hline$

① What? Addition

$4 = c$

② undo subtraction

③ Check

$12 = 8 + 4$   
 True

① Ask myself what is happening to the variable

② Undo what is being done.

③ We are to check by substitution.

Model

12
----

8		c
---	--	---

8		4
---	--	---

**Exercise 2**Given the equation  $d - 5 = 7$ :

a. Demonstrate how to solve the equation using tape diagrams.

$d - 5 = 7$

Algebraically

① What? Subtraction

② undo with addition on both sides

$$\begin{array}{r} d - 5 = 7 \\ +5 \quad +5 \\ \hline d = 12 \end{array}$$

With subtraction we start with the variable. Then put the subtrahend in one box and the answer in another box on the same line

$d$
$5 \quad   \quad 7$
$12 \quad \checkmark$

$d - 5 = 7$   
 $12 - 5 = 7 \quad \checkmark$  True!

## Exercise 3

Solve each problem, and show your work. You may choose which method (tape diagrams or algebraically) you prefer. Check your answers after solving each problem.

a.  $e + 12 = 20$

b.  $f - 10 = 15$

c.  $g - 8 = 9$

a) 
$$\begin{array}{r} e + 12 = 20 \\ -12 \quad -12 \\ \hline e = 8 \checkmark \end{array}$$

① Ask what?  
Added

③ undo sub.  
on both side

Check  
 $8 + 12 = 20$  T ✓

20	
e	12
8	12

$e = 8 \checkmark$

① what?

$$\begin{array}{r} f - 10 = 15 \\ +10 \quad +10 \\ \hline f = 25 \end{array}$$

f	
10	15
25	

$f = 25$

$25 - 10 = 15$  True ✓

$$\begin{array}{r} g - 8 = 9 \\ +8 \quad +8 \\ \hline g = 17 \checkmark \end{array}$$

g	
8	9
17	

$g = 17 \checkmark$

$17 - 8 = 9$  True ✓



$$30 \geq 38 - 8$$

$$30 \geq 30$$

### Example 1

Write true or false if the number substituted for  $g$  results in a true or false number sentence.

Substitute $g$ with	$\downarrow$ $4g = 32$	$\downarrow$ $g = 8$	$3g \geq 30$	$g \geq 10$	$\frac{g}{2} > 2$	$g > 4$	$30 \geq 38 - g$	$g \geq 8$
8	T	T	F	F	T	T	T	T
4	F	F	F	F	F	F	F	F
2	F	F	F	F	F	F	F	F
0	F	F	F	F	F	F	F	F
10	F	F	T	T	T	T	T	T

There is only 1 solution for an equation.

There are infinite solutions for an inequality

State when the following equations/inequalities will be true and when they will be false.

a.  $r + 15 = 25$

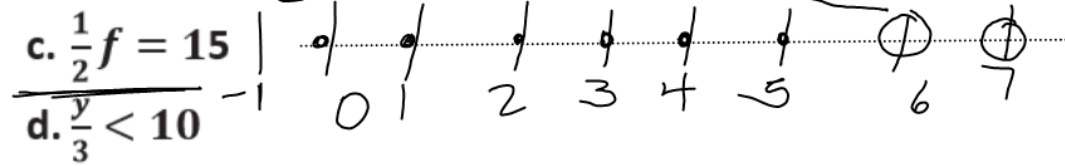
b.  $6 - d > 0$

c.  $\frac{1}{2}f = 15$

d.  $\frac{y}{3} < 10$

e.  $7g \geq 42$

f.  $a - 8 \leq 15$



c)  $\frac{1}{2}f = 15$   
 $f = 30$

d)  $\frac{y}{3} < 10$

## Exercises

**Complete the following problems in pairs. State when the following equations and inequalities will be true and when they will be false.**

1.  $15c > 45$

2.  $25 = d - 10$

3.  $56 \geq 2e$

4.  $\frac{h}{5} \geq 12$

5.  $45 > h + 29$

6.  $4a \leq 16$

7.  $3x = 24$

61,63,64,70,71,73,76,  
106.



**Identify all equality and inequality signs that can be placed into the blank to make a true number sentence.**

8.  $15 + 9$  \_\_\_\_\_  $24$

9.  $8 \cdot 7$  \_\_\_\_\_  $50$

10.  $\frac{15}{2}$  \_\_\_\_\_  $10$

11.  $34$  \_\_\_\_\_  $17 \cdot 2$

12.  $18$  \_\_\_\_\_  $24.5 - 6$

## Problem Set

State when the following equations and inequalities will be true and when they will be false.

1.  $36 = 9k$

2.  $67 > f - 15$

3.  $\frac{v}{9} = 3$

4.  $10 + b > 42$

5.  $d - 8 \geq 35$

6.  $32f < 64$

7.  $10 - h \leq 7$

8.  $42 + 8 \geq g$

9.  $\frac{m}{3} = 14$