

# 9.10 - Questions Handout #s 1 - 6 & 8 - 17

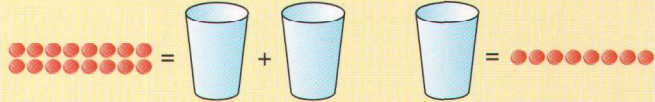
## Key Ideas

Equations can be solved in several ways. You can

– Solve by inspection.

$$16 = x - 5 \quad \text{The answer is } x = 21.$$

– Model the equation.



– Perform the opposite operation on both sides of the equal sign.

$$\begin{aligned} k \times 9.7 &= 164.9 \\ k \times 9.7 \div 9.7 &= 164.9 \div 9.7 \\ k &= 17 \end{aligned}$$

To check your solution, substitute your answer into the equation.

Then, compare the left side of the equal sign to the right side.

$$\begin{aligned} \text{Substitute } k &= 17. \\ \text{Left Side} &= k \times 9.7 & \text{Right Side} &= 164.9 \\ &= 17 \times 9.7 \\ &= 164.9 \\ \text{Left Side} &= \text{Right Side} \end{aligned}$$

## Communicate the Ideas

1. Explain why multiplication and division are considered opposite operations. How does applying the opposite operation help you solve an equation?

2. Describe a situation that can be modelled with each equation.

a)  $7y = 28$       b)  $z + 5 = 18$

3. Barbara is solving the equation  $k + 19 = 36$ .

a) Barbara realizes that she subtracted the wrong number. What operation did she mean to perform on both sides of the equal sign?

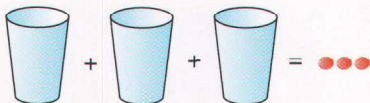
$$\begin{aligned} k + 19 &= 36 \\ k + 19 - 36 &= 36 - 36 \\ k - 17 &= 0 \end{aligned}$$

b) Does she have to start her solution over? Explain.

## Check Your Understanding

### Practise

4. What equation is modelled by the diagram?

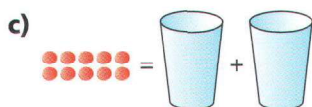
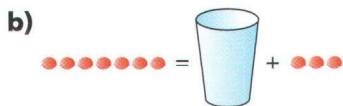
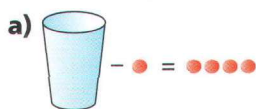


For help with questions 5 to 8, refer to Example 1.

5. What operation needs to be undone to get the cup by itself in each diagram?



6. Solve the equation modelled by each diagram.



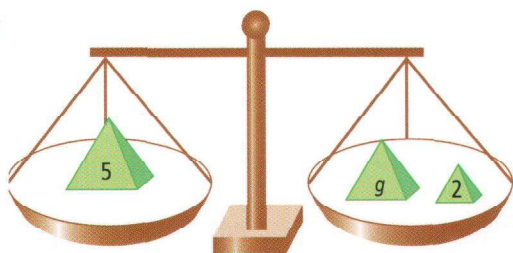
7. Model each equation using cups and counters.

a)  $9 = 3w$

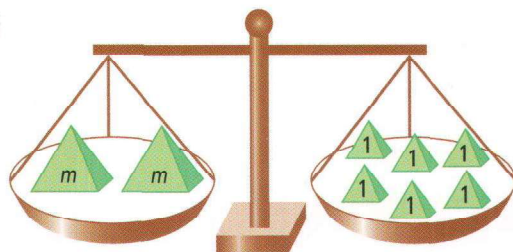
b)  $m + 4 = 6$

8. Find the value of each unknown mass.

a)



b)



9. Oscar gave \$15 toward a school trip. Sandra also gave money toward the trip. Together, they gave \$35.

- Model this situation using cups and counters.
- What do the cups and counters represent?
- Write a balanced equation to model this situation.
- What step would you perform to solve the equation?

10. Bill charges \$14 to shovel one driveway. He earned \$112 in February.

- Model this situation using an equation.
- Solve your equation to find how many driveways Bill shovels in February.

For help with questions 11 to 15, refer to Example 2.

11. For each expression, write the operation that is performed on the variable. Then, write the opposite operation.

a)  $15 + s$

b)  $p - 100$

c)  $z \div 54$

d)  $17 \times k$

12. Solve each equation by inspection.

Verify your answer.

a)  $5c = 20$

b)  $16 = 8n$

c)  $5 = w + 5$

d)  $p - 10 = 6$

13. Solve each equation using the opposite operation. Check your answer.

a)  $g + 7 = 13$

b)  $27 = 9m$

c)  $6 = j \div 4$

d)  $q - 4 = 1$

14. Solve each equation. Verify your solution.

a)  $j \div 10 = 12$

b)  $h \div 3 = -6$

c)  $7x = 21$

d)  $18 = f - 2$

15. Solve each equation. Verify your solution.

a)  $y + 4.9 = 20$

b)  $x + 7.9 = 10.3$

c)  $-2 = y - 8$

d)  $5.7 = b + 3.7$

## Apply

16. The equation  $\angle A + 30^\circ + 80^\circ = 180^\circ$  models the sum of the angles in this triangle. What is the missing angle measure?

17. A speed skater travels 800 m/min. This can be modelled with the formula  $d = 800t$ .

a) What do the variables represent?

b) How long will it take the skater to travel 5000 m?