

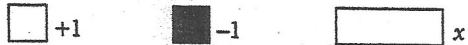
# 6.3

## Solving Equations Involving Integers



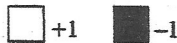
### Quick Review

As with balance scales, algebra tiles can be used to model and solve equations.



The +1 tile and -1 tile are called **unit tiles**. The  $x$ -tile is a **variable tile**.

One white unit tile and one black unit tile form a **zero pair**.



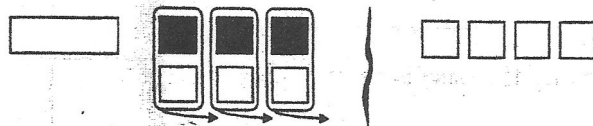
To solve the equation  $x - 3 = 1$ , use tiles to represent the equation.

What you do to one side of the equation, you also do to the other side.

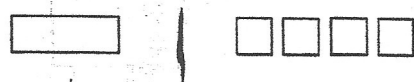


Isolate the  $x$ -tile by adding 3 white tiles to each side.

The tiles on the left side make zero pairs. Remove the zero pairs.

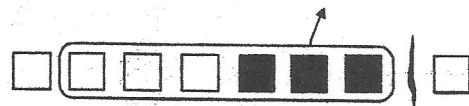


This arrangement becomes:



One  $x$ -tile equals 4 white tiles. So,  $x = 4$

To verify the solution: Replace the variable tile in the original equation with 4 white tiles.



Remove zero pairs. One white tile remains on the left side.

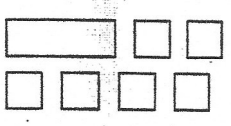
This matches the right side of the equation.

So, the solution is correct.

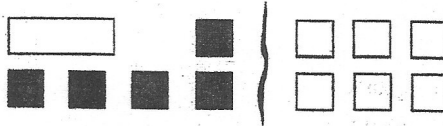
# Practice

1. Match each equation with an arrangement of tiles.

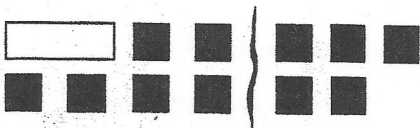
A.



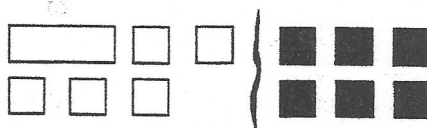
B.



C.



D.

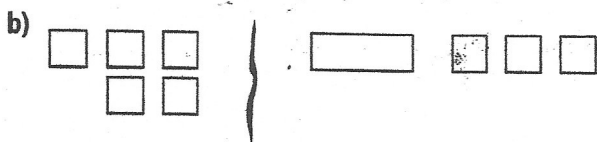


- a)  $x + 5 = -6$  \_\_\_\_\_ b)  $x + 6 = -5$  \_\_\_\_\_ c)  $x - 5 = 6$  \_\_\_\_\_ d)  $x - 6 = -5$  \_\_\_\_\_

2. Write the equation modelled by each set of algebra tiles. Then solve the equation.



**Tip**  
To isolate the x-tile, make zero pairs.



3. Sketch a set of algebra tiles that represents each equation. Then solve the equation.

- a)  $x + 3 = 9$  \_\_\_\_\_ b)  $3 = x - 5$  \_\_\_\_\_

4. Use tiles to solve each equation. Verify each solution.

a)  $3 + x = 9$   
 $x = \underline{\quad}$

b)  $x - 3 = 9$   
 $x = \underline{\quad}$

c)  $5 + x = 7$   
 $x = \underline{\quad}$

d)  $7 = x - 5$   
 $x = \underline{\quad}$

5. Solve each equation.  
Use tiles to help you.  
Verify each solution.

a)  $8 = n - 6$   
 $n = \underline{\quad}$

b)  $n + 5 = 3$   
 $n = \underline{\quad}$

c)  $7 = n - 8$   
 $n = \underline{\quad}$

d)  $n + 9 = -4$   
 $n = \underline{\quad}$

6. a) Eight less than a number is 10.  
Let  $n$  represent the number.  
Then, an equation is:  $n - 8 = 10$   
Solve the equation.

What is the number?                                 

b) Sixteen more than a number is 22.  
Write an equation, then solve it to find the number.

7. Between 5 P.M. and midnight, the temperature dropped by  $7^{\circ}\text{C}$  to  $-5^{\circ}\text{C}$ .

a) Write an equation you can solve to find the temperature at 5 P.M.                                 

b) Use tiles to solve the equation.   

8. Jamal thinks of an integer.  
He adds 8 to this number and the sum is 3.  
What is the integer?

Write an equation, then solve it using algebra tiles.

9. Solve each equation. Verify each solution.

a)  $x - 25 = 34$   
                                

b)  $x - 132 = -97$   
                                

c)  $54 = 130 + x$   
                                

d)  $176 + x = -24$