

# 10.3 Modelling and Solving Two-Step Equations

## Communicate the Ideas

$$ax + b = c$$

1. Describe how to isolate the variable when solving  $\frac{n}{5} - 12 = 6$ .

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2. Manjit thinks that the first step in solving the equation  $\frac{x}{-4} + 7 = 9$  is to multiply both sides of the equation by  $-4$ . He writes:

$$\frac{x}{-4} \times (-4) + 7 = 9 \times (-4)$$

Is he correct? Circle YES or NO.

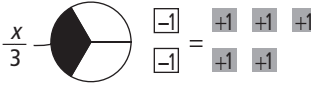
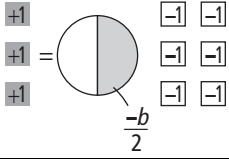
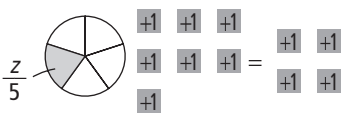
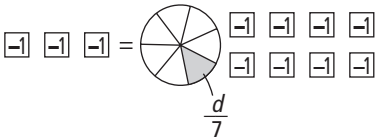
Give 1 reason for your answer. \_\_\_\_\_

## Check Your Understanding

### Practise

A constant is a number that is *not* connected to a variable.

3. Write the equation for each diagram and name the constants.

Diagram	Equation	Constants
<p>a) </p>		
<p>b) </p>		
<p>c) </p>		
<p>d) </p>		

4. Draw a model for  $\frac{g}{5} - 5 = 3$ . Then, solve and check your answer.

Model:

Solution:

Check:

$g =$  \_\_\_\_\_

Left Side	Right Side
$\frac{g}{5} - 5$	3

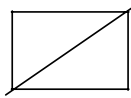
5. Solve each equation using the reverse order of operations. Check your answers.

a)  $2 + \frac{m}{3} = 18$

b)  $\frac{c}{-8} - 8 = -12$

$2 - \text{_____} + \frac{m}{3} = 18 - \text{_____}$

$\frac{m}{3} = \text{_____}$

  $\times \frac{m}{\cancel{3}} = \text{_____} \times \text{_____}$

$m = \text{_____}$

Check:

Check:

Left Side	Right Side

Left Side	Right Side

**Apply**

6. People 18 years old or younger need a certain number of hours of sleep each day.

The equation  $s = 12 - \frac{a}{4}$  tells you how many hours of sleep they need.

$s$  = amount of sleep needed, in hours

$a$  = age of the person, in years

a) If Brian needs 10 h of sleep, how old is he?

$$s = 12 - \frac{a}{4}$$

b) Natasha is 13 years old. She gets 8 h of sleep a night. Is this enough sleep?

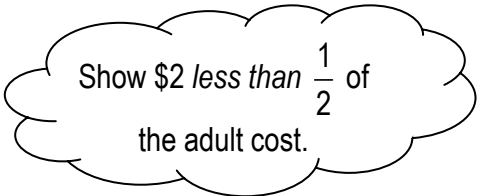
$$s = 12 - \frac{a}{4}$$

7. The cost of a concert ticket for a student is \$2 less than  $\frac{1}{2}$  of the cost for an adult.

a) Write an expression for the cost of a concert ticket for a student.

$a$  = the cost for an adult

Cost of student ticket =  $\frac{\boxed{\phantom{000}}}{\boxed{\phantom{000}}} a$  \_\_\_\_\_



b) If the cost of a student concert ticket is \$5, how much does the adult ticket cost?

Equation: \_\_\_\_\_

Sentence: \_\_\_\_\_