Name: _____ Date: _____

10.3 Modelling and Solving Two-Step Equations

$x/a + b = c$

Communicate the Ideas

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

_____

_____

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
a) $\frac{x}{3}$ = [–1] [–1] = [+1] [+1] [+1] [+1] [+1]		
b) [+1] [+1] [+1] = $\frac{-b}{2}$ [–1] [–1] [–1] [–1] [–1] [–1]		
c) $\frac{z}{5}$ [+1] [+1] [+1] [+1] [+1] [+1] [+1] = [+1] [+1] [+1] [+1]		
d) [–1] [–1] [–1] = $\frac{d}{7}$ [–1] [–1] [–1] [–1] [–1] [–1] [–1] [–1]		

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

Model: *Solution:*

Check:

Left Side	Right Side
$\frac{g}{2} - 5$	3

$g =$ _____

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

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

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

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

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

$m =$ _____

Check:

Left Side	Right Side

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

Check:

Left Side	Right Side

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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 = $\frac{\square}{\square} a$ _____

Show \$2 *less than* $\frac{1}{2}$ of the adult cost.

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

Equation: _____

Sentence: _____