

Section 3.2

TERMINOLOGY

3.2

For the following term, provide 1) a definition in your own words, 2) the formal definition (as provided by your text or instructor), and 3) an example of the term using a drawing or problem. A sample filled-out form is available in the Introduction.

Division Principle of Equality

Your definition	
Formal definition	
Example	

READING AND SELF-DISCOVERY QUESTIONS

3.2

1. What do you get when a number is divided by itself?

You will always get 1, except when the number is zero, in which case the expression is undefined.

2. If one side of an equation is divided by a number, what else must be done?

The other side of the equation must be divided by the same, non-zero number.

3. How can you verify that a solution to an equation is correct?

You can substitute the solution into the equation, and if the simplified equation is true, then the solution is correct.

CRITICAL THINKING QUESTIONS

3.2

1. Why does the Addition Principle of Equality work for subtraction as well as addition?

Subtraction is adding a negative number.

2. If you use the model of an algebra balance scale and put it out of balance, what have you done?

Operated on the equation unequally or made an incorrect substitution of one expression for another.

DEMONSTRATE YOUR UNDERSTANDING

3.2

1. Solve: $4m = 24$

$$4m = 24$$

$$\frac{4}{4}m = \frac{24}{4}$$

$$m = 6$$

2. Is 8 the solution to $5x = 40$? If not, what is the correct solution?

Substitute 8 for x :

$$5(8) = 40$$

$$40 = 40 \checkmark$$

Yes, 8 is the solution.

3. Make up an equation in the format $ax = c$ that has 6 as a solution.

There are literally an infinite number of correct answers to this problem.

The important point is that students recognize that $x = \frac{c}{a}$. Therefore, any fraction $\frac{c}{a}$

that is equivalent to 6 is a correct answer to this problem.

IDENTIFY AND CORRECT THE ERRORS

3.2

In the second column, identify the error(s) you find in the following worked solution and describe the error made. Solve the problem correctly in the third column.

Problem	Describe Error	Correct Process
Solve: $21 + (-3) = 100n - 82n$	<p style="color: #c00000;">The student has subtracted 18 from both sides of the equation instead of dividing both sides by 18. Because a coefficient is a multiplier (18 in the case of $18n$), the variable can only be isolated through the process of division (not subtraction).</p>	$21 + (-3) = 100n - 82n$ $18 = 18n$ $\frac{18}{18} = \frac{18}{18}n$ $1 = n$
<p style="text-align: center;">Worked Solution (What is wrong here?)</p>		
$21 + (-3) = 100n - 82n$ $18 = 18n$ $18 = 18n$ $\begin{array}{r} -18 \quad -18 \\ \hline 0 = n \end{array}$		