

Chapter 2

Study Guide

Math 101

1. Make time in your schedule to learn; you cannot take shortcuts.
2. Read each section in your textbook and answer the questions in the study guide before you go to class.
3. Take notes in class, trying to understand as the teacher presents examples and explains concepts.
4. Do your homework (It should be easier after the previous two steps). Make sure to understand what you are doing and be able to solve each problem completely and correctly by yourself.
5. Carry on a conversation with yourself as you work, asking as you start each problem, "What is this? What is my goal? What should my answer look like when I am done?" Then, as you work a problem ask, "What property allows me to take this step?" And at the end, " Does my answer make sense? How can I check it?"
6. Maintain a great attitude about learning Algebra; people who have a good attitude find it easier to learn, and those who learn algebra well usually enjoy it.
7. Go to the lab or your instructor's office and get help when you need it.

Section 2.1 Writing and evaluating Algebraic Expressions

Read section 2.1, pages 62 - 67 and answer the following questions as you read:

1. What are symbols used to represent in Algebra?
2. What is an algebraic expression? Give two examples of algebraic expressions different from the examples in the book.
3. Complete the table by identifying the terms of the expressions.

Expression	How many terms?	List the terms separated by commas.
$6y+7$		
$5x^2 - \frac{2}{x}$		
$2x^3 + 4x - 3x^2 + 5$		
$4x - 7y - 9$		
$7(x-4)+2$		

4. Identify the coefficients of the following terms.

a. x b. $-5x$ c. $\frac{x}{7}$

5. a. Write 3^5 as repeated multiplication.
b. Write -3^4 as repeated multiplication.
c. Write (-3^4) as repeated multiplication.
d. Write $(-3)^4$ as repeated multiplication.
d. Write $3x^4$ as repeated multiplication.
e. Write $(3x)^4$ as repeated multiplication.
f. Write $(3+x)^4$ as repeated multiplication.

6. What does it mean to evaluate an expression?

For each of the following, show your work neatly.

7. Evaluate the expression in example 5 e when $y=-2$.

8. Evaluate the expression in example 6 d when $x=5$ and $y=2$.

9. Evaluate the expression in 7a when $x=5$, $y=2$ and $z=-3$.

10. Example 8, which is about _____, if the table included one more x-value, what would it be? What is the value of $5x+2$ for this x?

Section 2.2 Simplifying Algebraic Expressions

Read section 2.2, pages 71 – 79 and answer the following questions as you read:

1. Make three note cards, one for each rule of exponent on page 71. Be sure to include on each note card a verbal description of the expression to be simplified and at least two examples.

2. Simplify each of the following expressions, if possible. If it is not possible, explain why.

a. x^2x^5

b. $(2y^2)(3y)^2$

c. $x^3 + x^5$

d. $(x + y^2)^3$

3. If you made note cards in chapter 1 for each of the properties, get them out and add an algebraic example to each one. If you did not make cards in chapter 1, make one now for each property. You should have nine cards when you are done. Be sure to include a way to remember each property.

4. Use the Distributive property to rewrite the following expressions.

a. $3(x-7)$

b. $-3(x-7)$

c. $-3x(x-7)$

5. Draw an area model (like those in example 5) for the multiplication $3a(2a+b)$.

6. What is the definition of like terms?

7. I identify the like terms in each of the following expressions by underlining terms that are like. If other terms are also like terms, double underline them.

Example: $\underline{2x} - \underline{4y} + 3z + 2x^2 + \underline{\underline{9y}} - \underline{\underline{3x}}$

a. $3a^2b - 7ba^2 + 14ab^2 - 25b^2a$ b. $6rt - 3r^2t + 2rt^2 - 4rt - 2r^2t$

8. Combine like terms in the last problem.

a.

b.

9. Simplify each expression.

a. $-2(6x)$

b. $\frac{2y}{3} \cdot \frac{5}{3}$

10. What number must we multiply by $\frac{2}{5}x$ to get x ? (Hint: look at example

10a.) What property are we using?

11. Example 11 talks about symbols of grouping. List all grouping symbols you know of.

12. To simplify an algebraic expression means to remove symbols of grouping and combine like terms. Simplify the following expressions.

a. $5 - 4[6x + 2x(3 - y)]$

b. $-\frac{3}{5}(10x - 15)$

Section 2.3 Algebra and Problem Solving

Read section 2.3, pages 85 - 95 and answer the following questions as you read:

1. What is algebra?

2. How do you tell an equation from an expression?

3. You are participating in a fundraiser where your employer pays \$2 for each mile you run and \$1.50 for each mile you bike ride for a week, write an expression that represents the total amount of money your employer will pay the charity. (Declare variables and write a verbal model first.)

4. Write the operation indicated by each of the following words:
 - a. Sum
 - b. Product
 - c. Difference

5. Translate the phrases into algebraic expressions:
 - a. The sum of 12 and a number
 - b. The product of a number and 5
 - c. 5 less than a number
 - d. A number less than 5
 - e. 10 less than the product of 3 and a number

6. Write a verbal description for each of the following algebraic expressions:
 - a. $2x+4$
 - b. $2(x+4)$

7. In example 6a give a verbal description of the 'value of nickel' multiplied by 'number of nickels'. That is, after the multiplication, how can you describe the meaning of the quantity?

7. What are equivalent equations?
8. List the four ways an equation can be transformed into an equivalent equation.
9. To solve each of the following equations, state your goal, state the step you are going to take and why you are going to take it. Then solve the equation

Example: $x+4=2$ My goal is to get x on one side of the equation by itself.
I am going to subtract 4 from each side since 4 is being added to x .

$$x+4-4=2-4$$

$$x=-2$$

a. $x-3=-5$

b. $2x=5$

c. $x/3=15$

10. Write a verbal model for each of the problems.

a. The sale price of a football is \$15. The sale price is \$4 less than the original price. What is the original price?

b. The original price of a shirt is \$45. The original price is marked down by \$12. What is the sale price?

Chapter 2 Review

1. What is different about solving equations and simplifying expressions?

2. What properties can you use to solve equations that you cannot use to simplify expressions?

3. What topics in chapter 2 are still confusing to you? (you may list problems you do not understand.)

