

# **Elementary Algebra**

**An Individualized Approach**

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**Parent's Manual**



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Permission is given to photocopy all tests contained herein.

# Elementary Algebra

## An Individualized Approach

### Parent's Manual

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## Introduction

Welcome to *Elementary Algebra, an Individualized Approach*. This course is designed to expand the basic concepts of Beginning Algebra and apply them to graphing on the xy-plane, problems involving polynomials, and solving quadratic equations. It is appropriate for students in Grade 8 or above who have acquired the objectives of Beginning Algebra. This is the perfect material for creating a solid background for courses in Liberal Arts mathematics or proceeding on a track toward other Algebras and higher mathematics.

The instruction provided is complete in every way. Every teaching objective is fully presented.

- Explanations are complete.
- Practice problems involve the student in working through each procedure.
- An email mentor is available 24/7 to answer any math questions or provide advice.
- A testing program guarantees accurate appraisals of the level of mastery for the material.

We, the publisher, guarantee the high quality of the instruction here. Success in gaining these Algebra skills depends on the student making wise decisions about the learning that occurs. Maintain high standards and that level of achievement will be achieved.

Use either the web site or the textbook for instruction. The material and quality of instruction are nearly identical. Some students prefer a book. Others like the web site. Some work back and forth between the two. Whatever works best is the rule to follow.

Our math curriculum is specifically designed to give each student, when he/she is ready for it, the information, drill/practice, and evaluation tools to successfully manage and monitor his/her own academic achievements. A parent's oversight is always beneficial, but H&H relieves the parent of any responsibility as an academic "master" of the subject content.

## Placement of Students in the Series

The first responsibility of the parent is properly placing the student in the material. This is best accomplished by giving and grading the placement test from the manual. The placement test for this course is located on page 15 of this manual. The placement test has a format that reveals those parts of the course already known by the student and those sections which must be studied. The answers to the placement test are located on page 16.

Although the placement test is extremely reliable, its use should be supplemented by the following practice. If the placement test indicates that the student should start with Chapter 3, the student should be required to take the chapter tests for Chapter 1 and 2 before beginning Chapter 3.

In any case where there is a question of the correct placement of the student, it is a good practice to be cautious and place the student accordingly. This is a situation where the judgement of the student should be respected. Begin at the point indicated by a conservative judgment on the results of the placement test, but, if the student feels the work is too simple, use the following procedure. Have the student take self-quizzes until the material becomes new or difficult for the student.

## Student Orientation

After testing and placement is completed, the parent's next responsibility is a detailed explanation of the content of the course, the use of the materials, parent testing, grading practices, and the maintenance of a student progress record.

- A. Course Content:** The content of *Elementary Algebra, an Individualized Approach*, is comparable to a second semester of Algebra as it is normally taught in high school. Chapter 1 reviews the algebras of the counting numbers, integers, and rational numbers. Chapters 2-3 extend the skills of beginning algebra to equations involving two variables. Chapter 4 reviews the use of counting numbers as exponents and then teaches integers as exponents. Chapters 5-7 involve polynomials. In Chapter 5 polynomials are added, subtracted, multiplied, and divided. Chapter 6 is devoted to factoring polynomials. Chapter 7 teaches the skills of polynomial fractions. Chapter 8 reviews the skills of solving linear equations and then extends those skills by attacking equations which involve polynomials. The last three chapters introduce the irrational numbers. Chapter 9 solves quadratic equations when the solutions are rational numbers and hints at the need for other (irrational) numbers. Chapter 10 introduces the irrational numbers and teaches all the skills for simplifying expressions with radicals. Chapter 11 solves equations with irrational or rational solutions.

Each chapter ends with an Application Unit teaching word problem-solving processes. Word problems are taught by breaking down the information and developing methods for extending these processes to more difficult problems to be encountered later.

- B. Proper Use of Instructional Materials:** If students choose to use the textbook as the primary source of instruction, the section from the text, “Directions for Using the Text,” needs to be carefully read and understood. If students choose the online instruction, the “Directions” link should be read in its entirety.

Of special importance is the necessity for using pencil and paper regularly. The psychology behind the instruction depends upon the student committing themselves before looking at the answer. For best results, read each explanation carefully, use pencil and paper to write an answer for its question, and then look at the answer. This process, when faithfully followed, will assure complete understanding of the information and skills taught.

- C. Testing:** Parent administered chapter tests (printed tests contained in this manual) may be taken after the student has taken the chapter self-test and reviewed whatever is necessary as shown by the self-test results. Parent administered chapter tests are easy when the chapter self-tests have been properly used. Refer to the flow chart on page 10 or 12 for more information on when to give parent administered chapter tests, cumulative tests, and course finals and what to do if the student receives a low score. The flow chart on page 10 is for students using the textbook and the other is for online students.

## **Maintaining Student Progress Records**

A relatively easy method for keeping a record of student progress is the form on the next page. This Weekly Progress Form has spaces for the student to report daily work and also asks for a self-evaluation of each week's progress. This procedure is a type of work contract and serves as an additional source of student motivation. The Weekly Progress Form can also be included in the student's academic portfolio and serves to document student progress throughout the course.

## **Math Mentor**

When unexpected difficulties are encountered, use the email Mentor to overcome such hurdles. You are guaranteed a reply to your request within 24 hours. There are two ways for you to contact your mentor:

1. Email. Your Mentor's email address is: [MathMentor@hhpublishing.com](mailto:MathMentor@hhpublishing.com).  
When sending an email request, it is helpful to include:
  - the chapter, unit, and paragraph number where the difficulty was encountered.
  - a description of the difficulty. If this is not possible, do not hesitate to ask because the other information is likely to be sufficient for the Mentor to provide a satisfactory response.
2. FAX. Your Mentor's FAX number is: (727) 442-2195. You can also use the FAX to send a request for help. Include the same information needed for email.

## Weekly Progress Form

Name: \_\_\_\_\_ Date: \_\_\_\_\_

At the end of each day's work, record the course, chapter, page, and frame completed.  
One hour of work per weekday is recommended.

Course Name: \_\_\_\_\_

	<u>Chapter</u>	<u>Unit</u>	<u>Frame</u>
Monday	_____	_____	_____
Tuesday	_____	_____	_____
Wednesday	_____	_____	_____
Thursday	_____	_____	_____
Friday	_____	_____	_____
Saturday	_____	_____	_____
Sunday	_____	_____	_____

Are you satisfied with your progress for the week? \_\_\_\_\_

## **Student Motivation**

*Elementary Algebra, an Individualized Approach* has many features that promote a high level of self-motivation. It has had great success in motivating students who have had a history of failure in mathematics. It has accomplished this success because every step seems easy as the student progresses through the material. The psychology of the instruction constantly motivates the student while providing new skills and knowledge that will maintain student confidence after the material is completed.

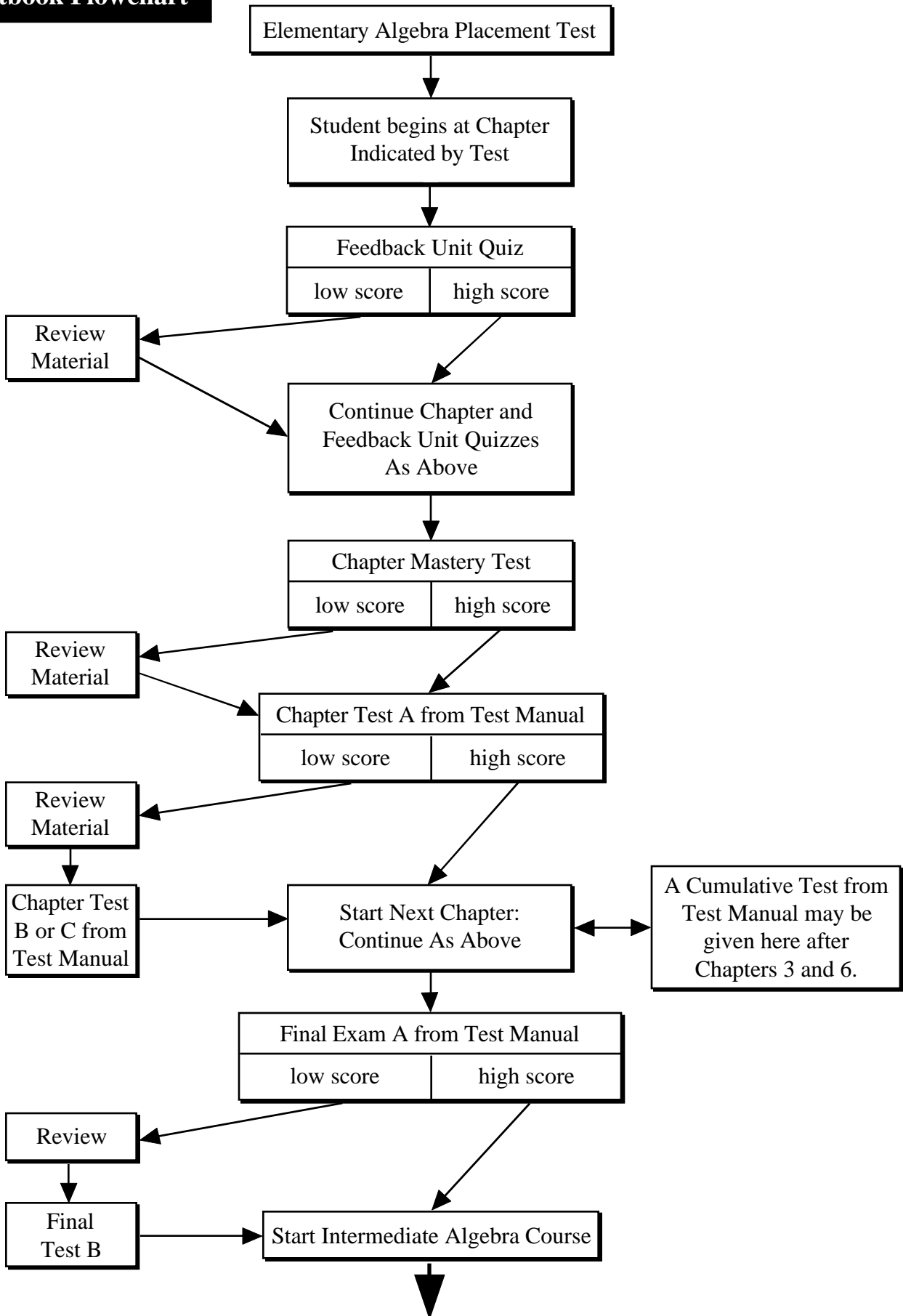
The testing program also helps to give the student a feeling of success and achievement. The self-quizzes and chapter self-tests serve the dual purpose of assuring the student of his/her ability to do the work and provides the student with a review of the material. This self-evaluation has a powerful influence on student motivation. The result is a mastery of the material that is evidenced on parent-given tests.

## **Time Required for Completion**

Students need to plan their time and their study with the realization that this course makes daily demands upon them. Any other schedule is an invitation for procrastination and eventual failure. The best results are achieved by students who spend about an hour each weekday. Lengthy study periods once or twice a week are an inefficient use of time.

Assuming that students maintain a consistent schedule to completion, it is quite possible to finish this course in approximately 11 weeks. Some students will be faster and others slower, but the secret to getting through this course successfully is to set a study schedule and stick to it.

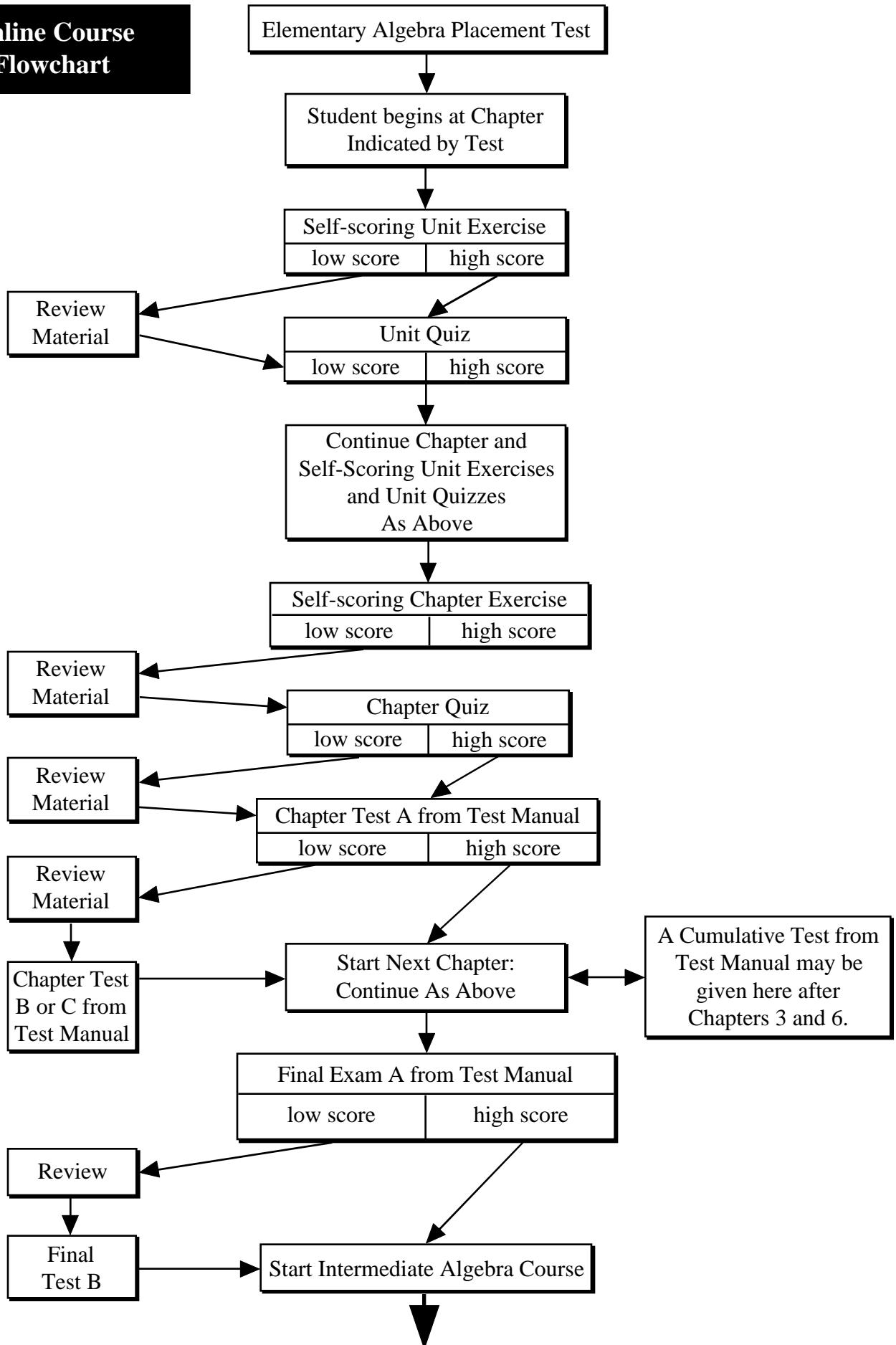
# Textbook Flowchart



## **Description of Textbook Flowchart**

1. Administer the placement test to the student.
2. Begin work at the Chapter indicated by the placement test.
3. Take and score the Feedback Unit Quiz. The answers are in the back of the textbook.
  - a. If the student scores 90% or better, continue work on the next unit or proceed to Step 4 after the last unit in the chapter is completed.
  - b. If the student scores less than 90%, review the material in the unit to discover why the material was not learned. Contact your Math Mentor for help as described on page 7 of this manual. Continue work on the next unit or proceed to Step 4 after the last unit in the chapter is completed.
4. Take and score Chapter Mastery Test. The answers are in the back of the textbook.
  - a. If the student scores 90% or better, the parent should administer a chapter test from the printed manual. Cumulative Tests can be given after chapters 3 and 6 and cover all topics up to that point in the instruction. Cumulative Tests are available in the printed manual. There are three forms of Chapter Tests for all nine chapters and two forms of the Cumulative Tests. Continue work in the next chapter or proceed to Step 5 after the last chapter is completed.
  - b. If the student scores less than 90%, review the material in the chapter to discover why it was not learned. Each problem on the Chapter Mastery Test is accompanied by a designation indicating where it is taught in the chapter. Use that information to restudy any portions of the chapter that the text indicates you have not mastered. The parent can now administer a Chapter Test from the printed manual. Cumulative Tests can be given after chapters 3 and 6 and cover all topics up to that point in the instruction. Cumulative Tests are available in the printed manual. There are three forms of Chapter Tests for all nine chapters and two forms of the Cumulative Tests. Continue work in the next chapter or proceed to Step 5 after the last chapter is completed.
5. The parent can now administer one of the two Final Tests from the printed manual.
  - a. If the student scores 90% or better, the student is now ready to begin the next course.
  - b. If the student scores less than 90%, review the material in the course to discover why it was not learned. The parent can now administer the other Final Test.

# Online Course Flowchart



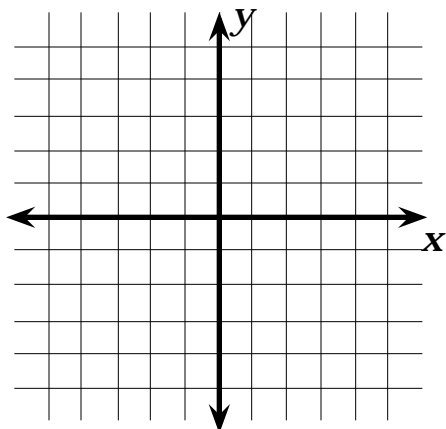
## Description of Online Instruction Flowchart

1. Administer the placement test to the student.
2. Begin work at the Chapter indicated by the placement test.
3. Take and score the Unit Exercise.
  - a. If the student scores 90% or better, continue work on the next unit or proceed to Step 4 after the last unit in the chapter is completed.
  - b. If the student scores less than 90%, review the material in the unit to discover why the material was not learned. Contact your Math Mentor for help as described on page 7 of this manual. Continue work on the next unit or proceed to Step 4 after the last unit in the chapter is completed.
4. Take the Unit Quiz. The Unit Quiz is a 10 item multiple-choice quiz that directly follows the Unit Exercise. The Unit Quiz is graded by the computer and the results are available to the parent by logging into the Administrative web site. At the completion of a Unit Quiz, the score along with an explanation of each response is given. Unlike the Unit Exercise, each Unit Quiz can be taken only one time. A Unit Quiz should only be taken after student is reasonably certain of scoring at least 90%.
  - a. If the student scores 90% or better on the Unit Quiz, continue work on the next unit or proceed to Step 5 after the last unit in the chapter is completed.
  - b. If the student scores less than 90%, review the material in the unit to discover why the material was not learned. Continue work on the next unit or proceed to Step 5 after the last unit in the chapter is completed.
5. Take and score the Chapter Exercise.
  - a. If the student scores 90% or better, proceed to Step 6.
  - b. If the student scores less than 90%, review the material in the chapter to discover why the material was not learned. Proceed to Step 6.
6. Take the Chapter Quiz. The Chapter Quiz is a 20 item multiple-choice quiz that directly follows the Chapter Exercise. The Chapter Quiz is graded by the computer and the results are available to the parent by logging into the Administrative web site. At the completion of a Chapter Quiz, the score along with an explanation of each response is given. Unlike the Chapter Exercise, each Chapter Quiz can be taken only one time. A Chapter Quiz should only be taken after student is reasonably certain of scoring at least 90%.

- a. If the student scores 90% or better, the parent should administer a chapter test from the printed manual. Cumulative Tests can be given after chapters 3 and 6 and cover all topics up to that point in the instruction. Cumulative Tests are available in the printed manual. There are three forms of Chapter Tests for all nine chapters and two forms of the Cumulative Tests. Continue work in the next chapter or proceed to Step 7 after the last chapter is completed.
  - b. If the student scores less than 90% on the Chapter Quiz, review the material in the chapter to discover why it was not learned. Restudy any portions of the chapter that you have not mastered. The parent can now administer a Chapter Test from the printed manual. Cumulative Tests can be given after chapters 3 and 6 and cover all topics up to that point in the instruction. Cumulative Tests are available in the printed manual. There are three forms of Chapter Tests for all nine chapters and two forms of the Cumulative Tests. Continue work in the next chapter or proceed to Step 7 after the last chapter is completed.
7. The parent can now administer one of the two Final Tests from the printed manual.
- a. If the student scores 90% or better, the student is now ready to begin the next course.
  - b. If the student scores less than 90%, review the material in the course to discover why it was not learned. The parent can now administer the other Final Test.

## Elementary Algebra Placement Test

1. Graph  $3x - 2y = -6$ .



2. Find the common solution:  $3x - 2y = 8$   
 $4x + y = 7$

3. Find the common solution:  $y = -2x$   
 $5x + 2y = 2$

4. Multiply  $(2x - 3)(5x + 2)$

5. Multiply  $(x - 2)(2x^2 - 3x + 4)$

6. Add  $\frac{x - 2}{x + 3} + \frac{3x - 5}{x - 3}$

7. Factor:  $x^2 - x - 12$

8. Factor:  $2x^2 - x - 3$

9. Simplify:  $\frac{x - 4}{x^2 - 6x + 8}$

10. Add:  $\frac{x + 3}{x^2 - x - 2} + \frac{x - 1}{x^2 - 3x - 4}$

11. Solve:  $\frac{5}{6}x - \frac{3}{4} = \frac{-2}{3}$

12. Solve:  $\frac{3}{5x} + \frac{7}{15} = \frac{9}{10}$

13. Find the Truth Set:  $\frac{4}{x - 6} + 3 = \frac{1}{x - 6}$

14. Find the Truth Set:  $x^2 - 25 = 0$

15. Find the Truth Set:  $2x^2 + x - 6 = 0$

16. Simplify:  $3\sqrt{75}$

17. Simplify:  $3\sqrt{27} + 2\sqrt{12}$

18. Solve:  $x^2 = 17$

19. Solve:  $(x + 3)^2 = 13$

20. The sum of two numbers is 7. The second number subtracted from 3 times the first number is 1. What are the numbers?



## Elementary Algebra Placement Test Answers

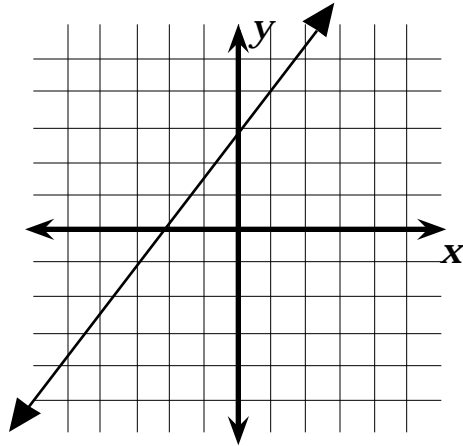
### Question

1.

### Chapter

Level

2



### Question

2. (2, -1)

### Chapter

Level

3

3. (2, -4)

3

4.  $10^2 - 11x - 6$

4

5.  $2x^3 - 7x^2 + 10x - 8$

4

6.  $\frac{4x^2 - x - 9}{x^2 - 9}$

5

7.  $(x + 3)(x - 4)$

6

8.  $(2x - 3)(x + 1)$

6

9.  $\frac{1}{x - 2}$

7

10.  $\frac{2x^2 - 4x - 10}{(x - 2)(x + 1)(x - 4)}$

7

11.  $\frac{1}{10}$

8

### Question

12.  $\frac{18}{13}$

8

13. {5}

8

14. {5, -5}

9

15.  $\{\frac{3}{2}, -2\}$

9

16.  $15\sqrt{3}$

10

17.  $13\sqrt{3}$

10

18.  $\{\sqrt{17}, -\sqrt{17}\}$

11

19.  $\{-3 + \sqrt{13}, -3 - \sqrt{13}\}$

11

20. 2 and 5

11

## **Testing Manual**

The test manual for *Elementary Algebra, an Individualized Approach* begins on the next page. It includes three forms of chapter tests for all nine chapters and two forms of cumulative tests for chapters 1-3, 1-5, 1-7, and 1-9. Also included are two forms of a book final. Answers to all tests are at the back of the manual.