

SAN DIEGO COMMUNITY COLLEGE DISTRICT  
CONTINUING EDUCATION  
COURSE OUTLINE

**SECTION I**

SUBJECT AREA AND COURSE NUMBER

HSDP 503

COURSE TITLE

MATH B-SEMESTER 2

TYPE COURSE

NON-FEE

HSDP

CATALOG COURSE DESCRIPTION

This is the second semester of a two semester course covering fundamental mathematical concepts and serving as a bridge between basic calculation skills and the study of algebra and geometry. It is tailored to a concrete learning style and provides opportunities for exploration, investigation, and reasoning while encouraging cooperative learning. The course integrates the themes of numbers and patterns, geometry and measure, statistics, graphical investigations, and algebra. (FT)

LECTURE HOURS

90

LABORATORY HOURS

ADVISORY

Math B-Semester 1 or equivalent.

RECOMMENDED SKILL LEVEL

NONE

INSTITUTIONAL STUDENT LEARNING OUTCOMES

1. Social Responsibility  
SDCE students demonstrate interpersonal skills by learning and working cooperatively in a diverse environment.
2. Effective Communication  
SDCE students demonstrate effective communication skills.

INSTITUTIONAL STUDENT LEARNING OUTCOMES (CONTINUED)

3. Critical Thinking

SDCE students critically process information, make decisions, and solve problems independently or cooperatively.

4. Personal and Professional Development

SDCE students pursue short term and life-long learning goals, mastering necessary skills and using resource management and self advocacy skills to cope with changing situations in their lives.

COURSE GOALS

Perform operations with rational numbers and algebraic fractions. Write ratios and proportions. Convert between fractions, decimals and percents and solve percent problems.

Find the area and perimeter (circumference) of polygons and circles and find the surface area and volume of basic solid figures. Use similar triangles for indirect measure and use the Pythagorean Theorem to calculate measurements.

Identify various geometric figures and work with the basic principles of similar and congruent polygons.

Work with algebraic equations and formulas containing rational numbers. Solve proportions. Work with linear equations with two variables, find slope and intercepts, graph solutions of systems of linear equations. Graph solutions to linear inequalities with one and two variables. Graph functions on a coordinate plane. Perform basic operations with polynomials.

Make and interpret various graphs and plots including stem-and-leaf plots, box and whisker plots, and circle graphs. Explore the concepts of probability, permutations and combinations.

Employ various strategies for problem solving including proportions, Venn diagrams, modeling, and working backwards.

COURSE OBJECTIVES

Each student who successfully completes this course will be able to:

1. Multiply rational numbers and algebraic fractions.
2. Find the quotient of rational numbers and algebraic fractions.
3. Add and subtract rational numbers and algebraic fractions with like denominators.
4. Add and subtract rational numbers and algebraic fractions with unlike denominators.
5. Estimate the sum, difference, or quotient of rational numbers.
6. Solve equations involving rational numbers.
7. Use reciprocals to solve equations.
8. Evaluate and transform formulas containing rational numbers.
9. Write ratios as fractions and write unit rates.
10. Solve proportions.
11. Interpret and use scale drawings.
12. Write fractions and decimals as percents and write percents as fractions and decimals.

COURSE OBJECTIVES (CONTINUED)

13. Find a percent of a number and estimate percents of numbers.
14. Find the percent one number is of another.
15. Find a number when a percent of it is known.
16. Find percent increase or decrease.
17. Use proportions to solve percent problems.
18. Find the perimeter of a polygon.
19. Identify and find the radius, diameter, and circumference of a circle.
20. Find the area of rectangles, parallelograms, triangles and trapezoids.
21. Find the area of a circle.
22. Identify corresponding parts of congruent figures.
23. Recognize similar polygons and use corresponding sides to find unknown lengths.
24. Use similar triangles to find an unknown measurement that cannot be measured directly.
25. Find the square root of a number using a table or a calculator.
26. Use the Pythagorean Theorem to find unknown lengths.
27. Organize data in a frequency table with intervals.
28. Make and interpret stem-and-leaf plots.
29. Interpret histograms and frequency polygons.
30. Make and interpret box-and-whisker plots.
31. Read, interpret, and construct circle graphs.
32. Find the probability of an event and determine the odds in favor of an event.
33. Use a tree diagram to find sample spaces and probabilities.
34. Use the counting principle to find the number of possible outcomes and to find a probability.
35. Find the probability of two independent and two dependent events.
36. Find the number of permutations and the number of combinations of a group of items.
37. Find the experimental probability of an event.
38. Make predictions using sampling and probability concepts.
39. Find solutions to linear equations with two variables.
40. Graph linear equations with two variables.
41. Find the slope and intercepts of a line and write the equation of a line using the slope and y-intercept.
42. Solve systems of linear equations by graphing.
43. Solve and graph linear inequalities with one variable.
44. Solve and graph linear inequalities with two variables.
45. Use a function rule to find values of a function.
46. Graph functions on a coordinate plane.
47. Identify various three-dimensional figures.
48. Find the surface area of a prism.
49. Find the surface area of a circular cylinder.
50. Find the volume of prisms and pyramids.
51. Find the volume of circular cylinders and cones.
52. Find the surface area and volume of a sphere.
53. Simplify polynomials.
54. Add and subtract polynomials.
55. Multiply a polynomial by a monomial.
56. Multiply binomials.
57. Factor polynomials.

COURSE OBJECTIVES (CONTINUED)

58. Divide a polynomial by a monomial.
59. Solve problems by supplying missing facts.
60. Use proportions as a problem solving strategy.
61. Decide whether perimeter, circumference, or area must be calculated to solve a given problem.
62. Decide which method is most appropriate for displaying different sets of data.
63. Recognize when a problem has no solution.
64. Use logical reasoning as a problem solving strategy.
65. Use Venn diagrams to solve problems.
66. Solve problems by using simpler problems.
67. Solve problems by making a model.
68. Solve problems by working backwards.

**SECTION II**

COURSE CONTENT AND SCOPE

1. Rational Numbers (12 hours)
  - 1.1. Multiplying rational numbers
  - 1.2. Dividing rational numbers
  - 1.3. Determine the correct form of an answer
  - 1.4. Adding and subtracting rational numbers with like denominators
  - 1.5. Adding and subtracting rational numbers with unlike denominators
  - 1.6. Estimating with rational numbers
  - 1.7. Problem solving: supplying missing facts
  - 1.8. Equations involving rational numbers
  - 1.9. Using reciprocals to solve equations
  - 1.10. Transforming formulas
2. Ratio, Proportion, and Percent (12 hours)
  - 2.1. Ratio and rate
  - 2.2. Proportions
  - 2.3. Scale drawings
  - 2.4. Strategy: using proportions
  - 2.5. Percent
  - 2.6. Finding a percent of a number
  - 2.7. Finding the percent one number is of another
  - 2.8. Finding a number when a percent of it is known
  - 2.9. Percent increase or decrease
  - 2.10. Percents and proportions
3. Circles and Polygons (12 hours)
  - 3.1. Perimeter
  - 3.2. Circles and circumference
  - 3.3. Area of polygons
  - 3.4. Area of circles
  - 3.5. Decision making: choosing perimeter, circumference, or area
  - 3.6. Problems with no solution

COURSE CONTENT AND SCOPE (CONTINUED)

- 3.7. Congruent polygons
- 3.8. Similar polygons
- 3.9. Indirect measurement
- 3.10. Square root
- 3.11. The Pythagorean theorem
- 4. Statistics and Circle Graphs (10 hours)
  - 4.1. Frequency tables
  - 4.2. Stem and leaf plots
  - 4.3. Histograms and frequency plots
  - 4.4. Box and whisker plots
  - 4.5. Scattergrams
  - 4.6. Interpreting circle graphs
  - 4.7. Constructing circle graphs
  - 4.8. Decision making: choosing an appropriate data display
  - 4.9. Strategy: using logical reasoning
- 5. Probability (12 hours)
  - 5.1. Probability and odds
  - 5.2. Sample spaces and tree diagrams
  - 5.3. The counting principle
  - 5.4. Independent and dependent events
  - 5.5. Using a Venn diagram
  - 5.6. Permutations and combinations
  - 5.7. Experimental probability
  - 5.8. Using samples to make predictions
- 6. Inequalities and Graphing on the Coordinate Plane (10 hours)
  - 6.1. Equations with two variables
  - 6.2. Graphing equations with two variables
  - 6.3. Slope and intercepts
  - 6.4. Systems of equations
  - 6.5. Strategy: solving a simpler problem
  - 6.6. Inequalities with one variable
  - 6.7. Two step inequalities with one variable
  - 6.8. Inequalities with two variables
  - 6.9. Function rules
  - 6.10. Function graphs
- 7. Surface Area and Volume (10 hours)
  - 7.1. Space figures
  - 7.2. Surface area of prisms
  - 7.3. Surface area of cylinders
  - 7.4. Volume of prisms and pyramids
  - 7.5. Volume of cylinders and cones
  - 7.6. Spheres
  - 7.7. Strategy: making a model
- 8. Polynomials (12 hours)
  - 8.1. Simplifying polynomials
  - 8.2. Adding polynomials
  - 8.3. Subtracting polynomials

COURSE CONTENT AND SCOPE (CONTINUED)

- 8.4. Multiplying a polynomial by a monomial
- 8.5. Multiplying binomials
- 8.6. Strategy: working backwards
- 8.7. Factoring polynomials
- 8.8. Dividing a polynomial by a monomial

APPROPRIATE READINGS

NONE

WRITING ASSIGNMENTS

NONE

OUTSIDE ASSIGNMENTS

Students are expected to spend approximately 30 minutes in outside study for each class lesson. Assignments may include, but not necessarily be limited to:

1. Completion of assigned problem sets.
2. Studying textbook material.
3. Preparing for unit examinations.

APPROPRIATE ASSIGNMENTS THAT DEMONSTRATE CRITICAL THINKING

Students will be required to select and apply appropriate problem solving strategies to solve verbal problems.

EVALUATION

Student performance assessment will be based upon, but not necessarily limited to, periodic quizzes, chapter examinations, completion of written assignments, and attendance and participation in class.

METHOD OF INSTRUCTION

Lectures, instructor guided discussions, individual tutoring, and cooperative learning in peer groups will assist the students in successfully completing their work. In addition, when considered appropriate by the instructor, individual work packets may be provided to the students to facilitate small group and individual, self-paced work. Manipulatives such as number cubes, spinners, algebra tiles, and paper models will be used to aid in studying mathematical concepts. Field trips may be utilized.

TEXTS AND SUPPLIES

Texts:

*Mathematical Connections*, Gardella, Frazee, Meldon, and Weingarden: Houghton-Mifflin 1992  
Teacher's Guide and Student Work Packets (Published by San Diego City Schools.)

TEXTS AND SUPPLIES (CONTINUED)

Supplies:

Suggested items to be used in demonstrating mathematical concepts include fraction bars, algebra tiles, number cubes, spinners, construction paper and scissors.

It is recommended that each student have a scientific calculator.

PREPARED BY: Jerry Sullivan DATE AUGUST 28, 1995

DATA REVISED BY Instructional Services/SLO's Added DATE January 24, 2014

Instructors must meet all requirements stated in Policy 3100 (Student Rights, Responsibilities and Administrative Due Process), and the Attendance Policy set forth in the Continuing Education Catalog.

REFERENCES:

San Diego Community College District Policy 3100  
California Community Colleges, Title 5, Section 55002  
Continuing Education Catalog