



#10148 THE SAT I MATH BRAIN POWER: CIRCLES AND RECTANGLES

CEREBELLUM CORPORATION, 2002
Grade Level: 9-12
27 mins.

DESCRIPTION

Focuses on the geometry portion of the SAT. Reviews formulas and tips for solving problems about perimeter and area, parallel lines and angles, circles, volume, coordinates and slopes, and quantitative comparison. Ends with suggestions of ways to improve SAT performance. Reminds viewer that formulas are given on the SAT.

ACADEMIC STANDARDS

Subject Area: Mathematics

- Standard: Uses a variety of strategies in the problem-solving process
 - ◆ Benchmark: Uses a variety of strategies (e.g., identify a pattern, use equivalent representations) to understand new mathematical content and to develop more efficient solution methods or problem extensions (See INSTRUCTIONAL GOALS 3 and 9.)
 - ◆ Benchmark: Uses formal mathematical language and notation to represent ideas, to demonstrate relationships within and among representation systems, and to formulate generalizations (See INSTRUCTIONAL GOALS 1.)
- Standard: Understands and applies basic and advanced properties of the concepts of measurement
 - ◆ Benchmark: Understands formulas for finding measures (e.g., area, volume, surface area) (See INSTRUCTIONAL GOALS 2 and 3.)
- Standard: Understands and applies basic and advanced properties of the concepts of geometry
 - ◆ Benchmark: Uses inductive and deductive reasoning to make observations about and to verify properties of and relationships among figures (e.g., the relationship among interior angles of parallel lines cut by a transversal) (See INSTRUCTIONAL GOALS 4 and 5.)
- Standard: Understands and applies basic and advanced properties of functions and algebra

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- ◆ Benchmark: Uses the rectangular coordinate system to model and to solve problems (See INSTRUCTIONAL GOALS 6.)
- ◆ Benchmark: Understands special values (e.g., minimum and maximum values, x- and y-intercepts, slope, constant ratio or difference) of patterns, relationships, and functions (See INSTRUCTIONAL GOALS 7 and 8.)

INSTRUCTIONAL GOALS

1. To review definitions of terms used in geometry.
2. To use formulas to find perimeter, area, circumference, and volume.
3. To point out how to find the area of irregular shapes and shaded regions.
4. To examine the process of elimination as a tool in helping to find the answer.
5. To determine the measures of angles relevant to their position with other angles.
6. To demonstrate how to plot points on a coordinate graph.
7. To find the slope of a line given two sets of coordinates.
8. To identify the positions of lines having positive, negative, or zero slopes.
9. To suggest hints for solving problems involving quantitative comparison.

BACKGROUND INFORMATION

This video covers the geometry topics of finding the perimeter; area; circumference; and volume, as well as parallel lines; coordinate graphing, including slope; and quantitative comparisons. Triangles are covered in more detail in CMP #10149, *The SAT 1 Math Brain Power: Probability and Geometry*.

VOCABULARY

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|--------------------|--------------------|-----------------------------|
| 1. adjacent angles | 7. interior angles | 13. quantitative comparison |
| 2. area | 8. isosceles | 14. radius |
| 3. circumference | 9. parallelogram | 15. slope |
| 4. coordinates | 10. perimeter | 16. vertical angles |
| 5. diameter | 11. pi | 17. volume |
| 6. exterior angles | 12. quadrilateral | |

BEFORE SHOWING

1. Discuss the meaning of standardized tests and why they are important. List some standardized tests given in the local school district.
2. Explain the difference between the SAT 1 and SAT 2. What are the scores on the SATs used for?
3. Review evaluating expressions by replacing variables with numbers.
4. Review the names of various geometric shapes.

DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause after the section introducing quadrilateral ABCD.
 - a. Draw the figure on the overhead or on poster board so that it can easily be seen.

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- b. Retrace the steps leading to the solution of the problem.
 - c. Discuss the process of elimination as a useful tool in finding the answer.
 - d. Discuss and draw other geometric figures that can be divided into smaller shapes to find the total area.
3. Pause after the section containing the drawing showing eight angles formed when two parallel lines are crossed by a third line.
 - a. Draw the figure on the overhead or on poster board so that it can easily be seen.
 - b. Color-code the angles that are equal.
4. Pause after the section showing the drawing with angles x and y .
 - a. Draw the figure on the overhead or on poster board so that it can easily be seen.
 - b. Retrace the steps leading to the solution of the problem.
5. Pause after the sections explaining how to find the circumference and area of circles.
 - a. Review the definition of π .
 - b. The answers in the video are given in terms of π . Calculate the numerical values by using 3.14 for π .
6. Pause at the section containing the drawing of a circle inscribed in square WXYZ.
 - a. Draw the figure on the overhead or on poster board so that it can easily be seen.
 - b. Discuss why this problem does not seem to have enough information.
 - c. Retrace the steps leading to the solution of the problem.
 - d. Discuss how the process of elimination can be used to help arrive at the correct answer.
 - e. Discuss some practical applications of this problem (e.g., measuring the amount of concrete needed around a circular pool, figuring the efficiency of packaging circular objects).
7. Pause at the section on volume.
 - a. Calculate the numerical values using 3.14 as π .
 - b. What are some practical applications for finding the volumes of rectangular boxes and cylinders?
8. Pause after the section on plotting points on a coordinate graph.
 - a. Practice plotting several points on a sheet of graph paper.
 - b. Name the coordinates of several points that are already plotted on a graph.
 - c. Create questions similar to the one presented in this section and solve as a group.
9. Pause at the section on slope.
 - a. Define *positive*, *negative*, and *zero slopes*. Point out that slope can also be undefined.
 - b. Practice finding the slope of several lines where two sets of coordinates are given.
10. Pause after the section on quantitative comparison.
 - a. Discuss why the quantitative comparison questions can be tricky.
 - b. Discuss why it is important to redraw the figures that are not drawn to scale.

AFTER SHOWING

Discussion Items and Questions

1. Where are all the formulas for the geometry section of the test?
2. Define *perimeter* and *area*. Tell the formulas for figuring the perimeter and area of triangles and rectangles.
3. What is the best way to find the area of any quadrilateral?
4. Explain what parallel lines are. How many angles are formed when two parallel lines are cut by a third line? How can you use one angle to figure out all the other angles?
5. Why is it critical to know the radius of a circle? What does *circumference* mean? What are the formulas for figuring the circumference and area of a circle?
6. Explain the formulas for finding the volume of a cylinder and a rectangular box.
7. Describe the basic components of coordinate graphing.
8. With the quantitative comparison questions, why is it important not to settle for the first answer you come up with? Why can't you trust the drawings in this section?
9. What kind of attitude should you have when taking the SAT?
10. Describe how the point system works on the SAT.
11. Identify some tips for taking the SAT.
12. What should you do when taking a practice SAT?
13. What is the best way to prepare for the SAT?

Applications and Activities

1. Research and report on the history of the SAT.
2. The term SAT is not considered to be an initialism or an acronym. Report on the difference between initialisms and acronyms. List examples of each.
3. Report on other college admission tests.
4. Develop a slide show presentation about perimeter, circumference, area, and volume of different geometric shapes.
 - a. Include the formulas, and show a sample problem for each.
 - b. Use graphics of real-life objects that have these shapes: bicycle wheel, soda pop can, floor plan of basketball court, and fish aquarium.
 - c. Include perimeter, area, and volume word problems, and solve as a group.
5. Create a chart of formulas for perimeter, circumference, area, and volume of various shapes. Print on bright-colored paper and keep in notebooks as a reference.
6. Research textbooks and online sites for quantitative comparison questions. Write the questions on poster board, and solve individually or as a group. Make note of tips used to save time.
7. Obtain copies of SAT prep books sold in most bookstores. Select questions related to geometry. Solve the problems individually or as a group.
8. Research practical applications of the coordinate graph (e.g., sports arena seats, locations on maps, designing of bridges).

CMP RELATED RESOURCES

- *The SAT 1 Math Brain Power: Probability and Geometry #10149*
- *The SAT 1 Prep Game #3511*
- *All About Angles #3205*

World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and “kid safe” sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

• STANDARD DEVIANTS

http://www.standarddeviants.com/pls/brain/cerebellum.show_department?p_dept_id=5

Includes downloadable tests, interactive quizzes, helpful cards, and puzzles for algebra, basic math, geometry, prealgebra and the SAT.

• SAT PREP CENTER

http://www.collegeboard.com/student/testing/sat/prep_one/prep_one.html

Includes free practice questions, a mini SAT download, a mathematics review, and a list of test-taking tips.

• COLLEGE SAT ENTRANCE TEST

http://www.campusprogram.com/reference/en/wikipedia/s/sa/sat_college_entrance_test.html

Contains information about the history and name change of the SAT, criticisms and concerns about the test, and links to other college board tests.

• ASK DR. MATH

<http://mathforum.org/dr.math/>

Contains an archive of questions and answers about math, including topics covered in the video.