ACT®: Mathematics

2023-2024SY

MISSISSIPPI
DEPARTMENT OF
EDUCATION

VISION

To create a world-class educational system that gives students the knowledge and skills to be successful in college and the workforce, and to flourish as parents and citizens

MISSION

To provide leadership through the development of policy and accountability systems so that all students are prepared to compete in the global community

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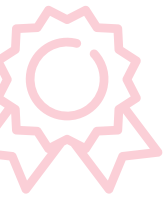
1 **ALL** Students Proficient and Showing Growth in All Assessed Areas

2 **EVERY** Student Graduates from High School and is Ready for College and Career

3 **EVERY** Child Has Access to a High-Quality Early Childhood Program

4 **EVERY** School Has Effective Teachers and Leaders

5 **EVERY** Community Effectively Uses a World-Class Data System to Improve Student Outcomes

**6** **EVERY** School and District is Rated "C" or Higher

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The Basics

The mathematics section is:
- designed to assess the mathematical skills students have typically acquired in courses taken up to the beginning of grade 12.

- emphasizes the major content areas that are prerequisites to successful performance in entry-level courses in college mathematics.

Number of Questions	Total Minutes for Section
60	60
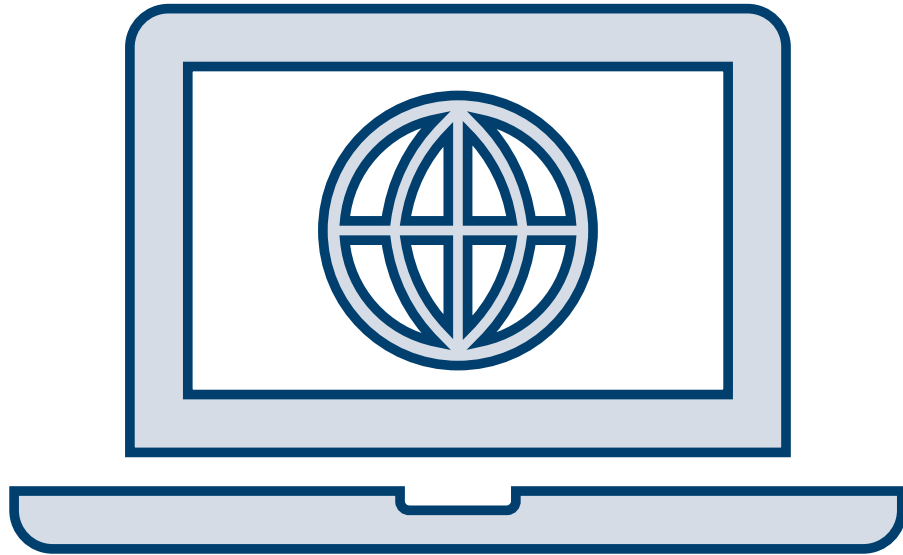
NOTE: Click the image to access the standards in the preferred format.

- Most questions are self-contained.
- Some questions may belong to a set of several questions (e.g., each about the same graph or chart).

The ACT® does not provide any formulas during the assessment. The following formulas, provided in the get2college guidebook, are typically assessed during the ACT®.

get2college [PDF]

$r^2 = (x - h)^2 + (y - k)^2$
*Equation of a Circle***

$= \frac{1}{2}(base)(height)$
Area of a Triangle

$= (base)(height)$
Area of a Square/Rectangle

$= (length)(width)(height)$
Volume of a Rectangular Solid

$= \pi r^2$
Area of a Circle

$= 2\pi r \; or \; \pi d$
Circumference of a Circle

$A^2 + B^2 = C^2$
*Pythagorean Theorem**

$\dfrac{y_2 - y_1}{x_2 - x_1}$
Slope Formula

$= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Distance Formula

$\left(\dfrac{x_1 + x_2}{2} , \dfrac{y_1 + y_2}{2} \right)$
Midpoint Formula

$sine = \dfrac{opposite}{hypotenuse}$

$cosine = \dfrac{adjacent}{hypotenuse}$
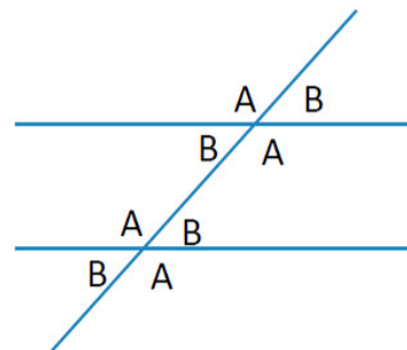
$tangent = \dfrac{opposite}{adjacent}$

Trigonometric Functions

* Used only with right triangles, where a and b are legs, and c is the hypotenuse.
** (h,k) represents the center point of the circle

When a third line cuts across two parallel lines, the small angles are all equal and the large angles are all equal. The sum of a small angle and a large angle is equal to 180°.


A + B = 180

Perimeter = sum of all sides

A line is a 180° degree angle

The sum of the interior angles of a triangle is 180°. The sum of the interior angles of a four-sided polygon is 360°. Add 180° to the sum of the interior angles for each additional side added to a polygon.

The **slope-intercept** equation of a line is y=mx+b where m is the slope and b is the y-intercept.

Parallel lines always have the same slope. Perpendicular lines always have opposite reciprocal slopes.
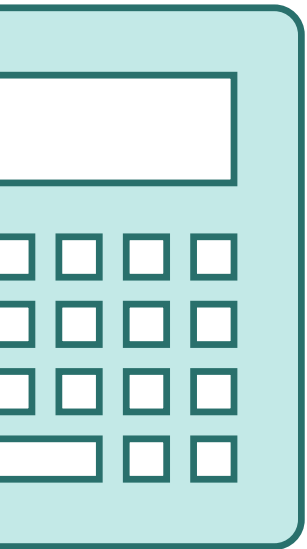
Calculator Usage

A calculator is not required. All problems can be solved without a calculator. However, a calculator can be used for any math problem.

If you choose to use a calculator, use one you're familiar with when you take the mathematics test.

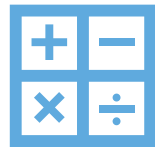Review the latest information on permitted and prohibited calculators. (See link below.)

2023-2024 ACT Calculator Policy

Test Categories

This category covers the more recent mathematics students are learning, starting when they began using algebra as a general way of expressing and solving equations. This category is divided into five subcategories:
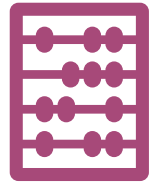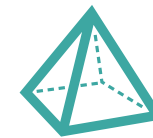
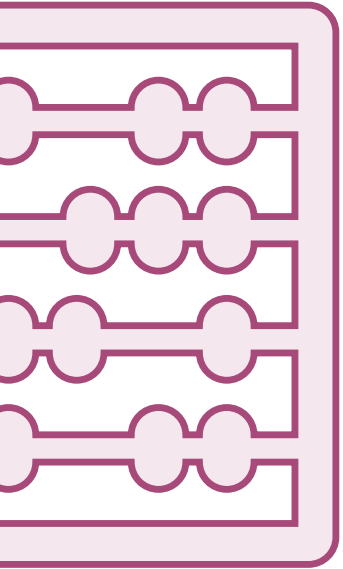| Number and Quantity (7-10%)	Algebra (12-15%)	Functions (12-15%)	Geometry (12-15%)	Statistics & Probability (8-12%)

For this category, testers are asked to :

- Demonstrate knowledge of real and complex number systems.

- Understand and reason with numerical quantities in many forms, including integer and rational exponents, vectors, and matrices.

For this category, testers are asked to:

- Solve, graph, and model multiple types of expressions.

- Interpret and use many different kinds of equations, such as linear, polynomial, radical, and exponential relationships.

- Find solutions to systems of equations, even when represented by a simple matrix equation, and apply results to real-world contexts.
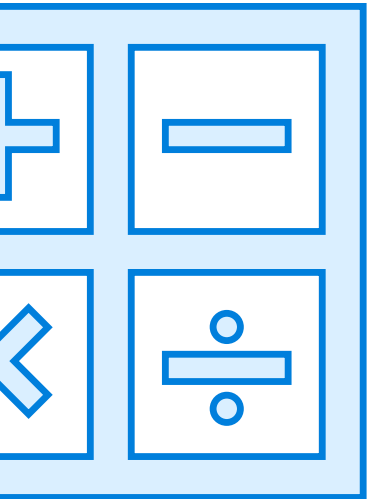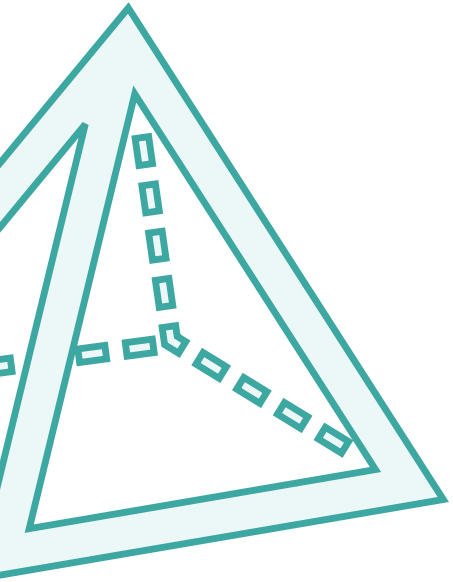
For this category, testers are asked to :

- Demonstrate knowledge of function: definition, notation, representation, and application.

- Use functions including linear, radical, piecewise, polynomial, exponential, and logarithmic.

- Manipulate and translate functions.

- Interpret and use important features of graphs.

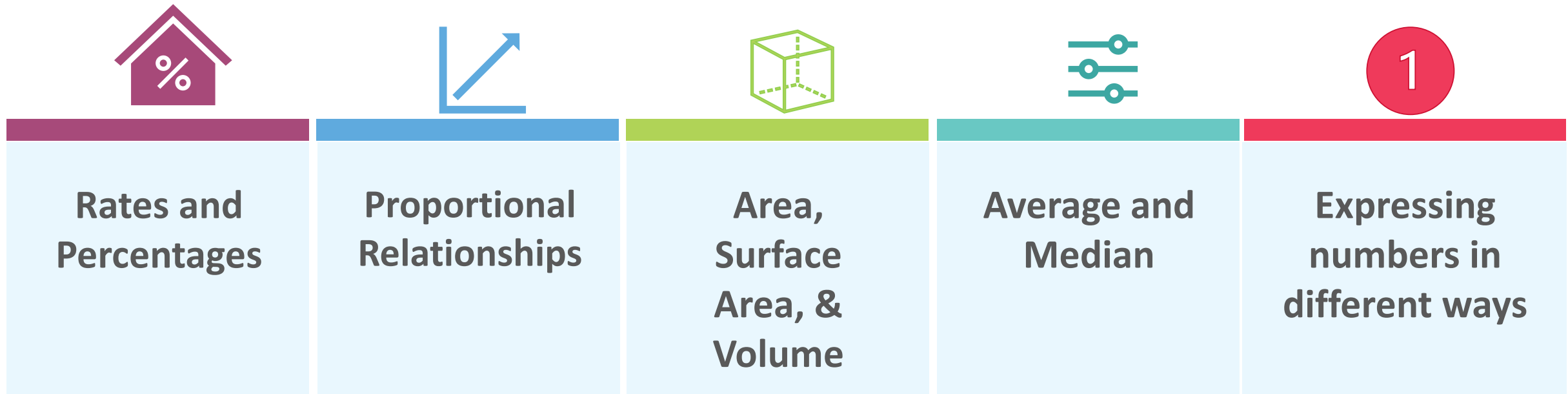**For this category, testers are asked to:**

- Apply knowledge of shapes and solids, using concepts such as congruence and similarity relationships or surface area and volume measurements.

- Apply understanding to composite objects and solve for missing values in triangles, circles, and other figures.

- Use trigonometric ratios and equations of conic sections.

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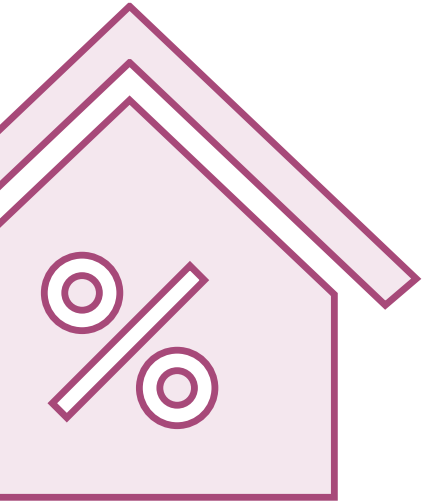**For this category, testers are asked to :**

- Describe center and spread of distributions.

- Apply and analyze data collection methods.

- Understand and model relationships in bivariate data.

- Calculate probabilities by recognizing the related sample spaces.
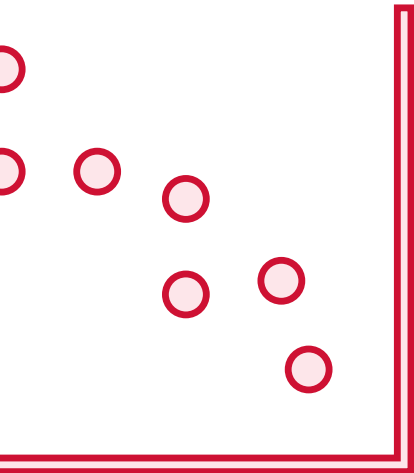
This category focuses on measuring how well you can **synthesize and apply** your understandings and skills to solve more complex problems. This includes non-routine problems that involve combining skills in chains of steps, applying skills in varied contexts, understanding connections, and **demonstrating fluency**. The questions ask you to address concepts such as:

Rates and Percentages	Proportional Relationships	Area, Surface Area, & Volume	Average and Median	Expressing numbers in different ways

Available supports in this category:

- [Rates and percentages](#) -6th grade

- [Rates and percentages](#) – 7th grade

- [Unit Rate and percentages](#)

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Available supports in this category :

- [Intro to proportional relationships](#) (video)

- [Intro to proportional relationships](#) (video)

- [Rates & proportional relationships](#) (practice)

- [Proportional relationships](#) (7th grade)

- [Proportional relationships](#) (practice)

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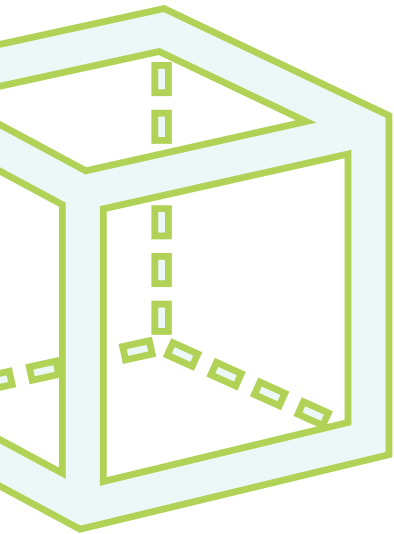DEPARTMENT OF
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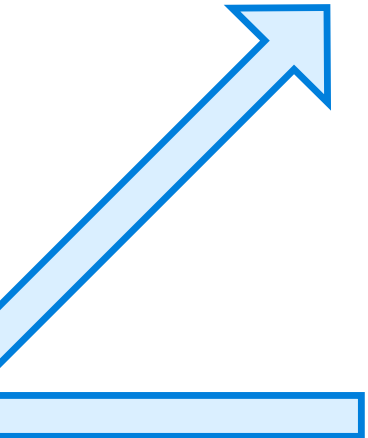
Available supports in this category :

- [Area of rectangles](#) (practice)
- [Area of right triangles](#) (practice)
- [Area of a circle](#) (practice)
- [Area of a circle](#) (video)
- [Area of parts of a circle](#) (practice)
- [Area and circumference of circles challenge](#) (practice)
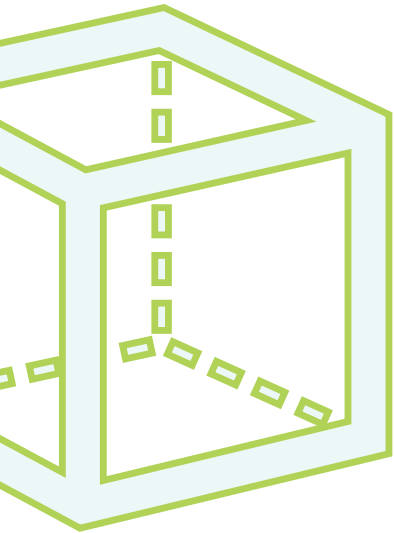
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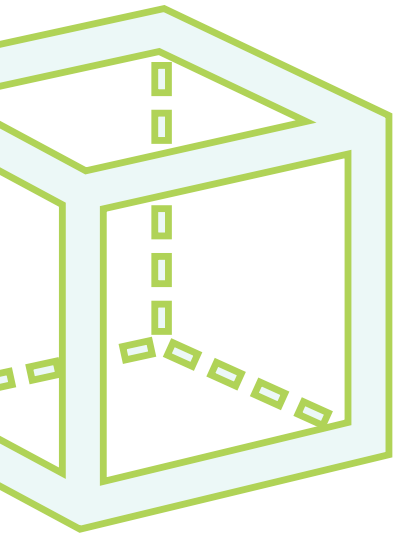
Available supports in this category :

- [Volume intro: how we measure volume](#) (video)

- [Volume of rectangular prisms](#) (practice)

- [Volume with unit cubes](#) (practice)

- [Volume as area of base times height](#) (practice)

- [Volume by multiplying area of base time height](#) (practice)

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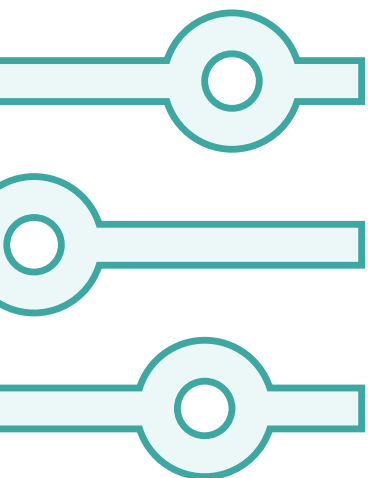**Available supports in this category :**

- Surface area review (article)
- Surface area of a box/cuboid (video)
- Expressions to find surface area (practice)
- Volume and surface area of cylinders (practice)
- Surface area - High school geometry (practice)

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Available supports in this category :

- [Mean, median, mode review](#) (article)
- [Statistics intro: Mean, median, and mode](#) (video)
- [Mean, median, and mode example](#) (video)
- [Mean, median, and mode](#) (practice)
- [Mean, median, mode, range](#) (practice)

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Available supports in this category :

1

- [Writing numbers in words and standard form](#) (video)

- [Write whole numbers in different forms](#) (practice)

- [Writing improper fractions as mixed numbers](#) (video)

- [Expressing decimals in multiple forms](#) (video)

- [Scientific notation](#) (practice)

- [Simplify roots of negative numbers](#) (practice)

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This category represents all questions that involve producing, interpreting, understanding, evaluating, and improving models. Each question is also counted in other appropriate reporting categories previously listed. This category is an overall measure of how well modeling skills are used across mathematical topics.

ACT® Testing Tips & Strategies

- Read each question carefully to ensure you understand the type of answer required.

- If you choose to use a calculator, be sure it is permitted, works on test day, and has reliable batteries.

- Use your calculator wisely.

- Solve the problem.

- Locate your solution among the answer choices.

- Make sure you answer the question asked.

- Make sure your answer is reasonable.

- Check your work.

- Do not linger over problems that take too much time. Solve as many as you can, then return to the others in the time you have left for this test.

- [ACT Math Strategies & Tips](#)

- [Top 12 ACT Math Topics & Key Concepts](#)

- [How to Improve Your ACT Score](#)

- [ACT Test Taking Strategies](#)

- [It's Time to Talk about ACT Timing Tips](#)

Test Prep Resources
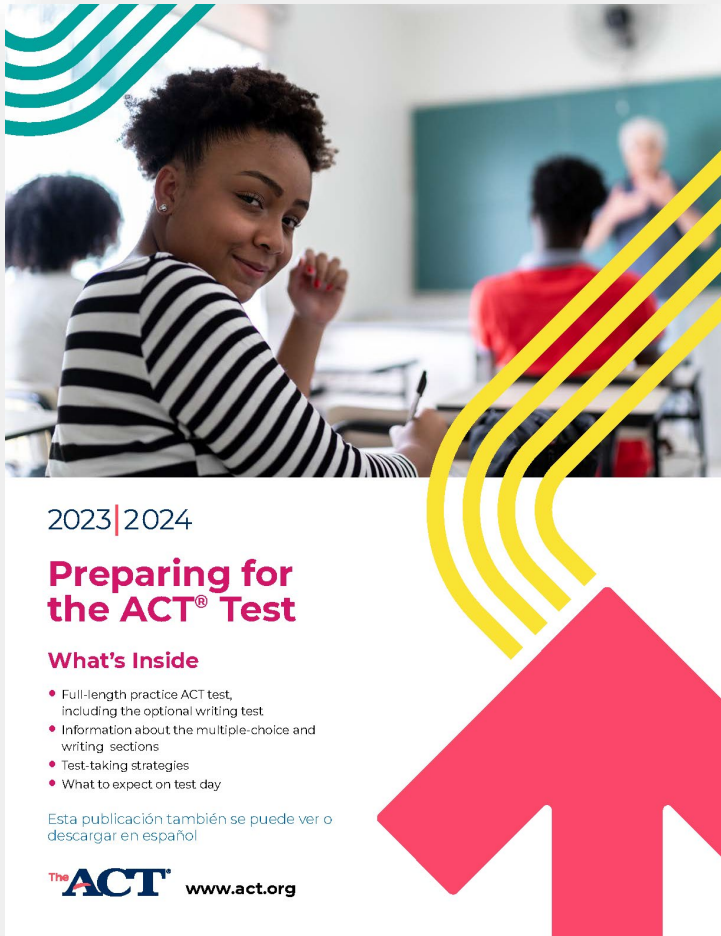
Are you in need of test prep materials? ACT® offers *FREE* test prep options, such as the

Free Practice Test and Study Guide, which includes:

- Full-length ACT® practice test,
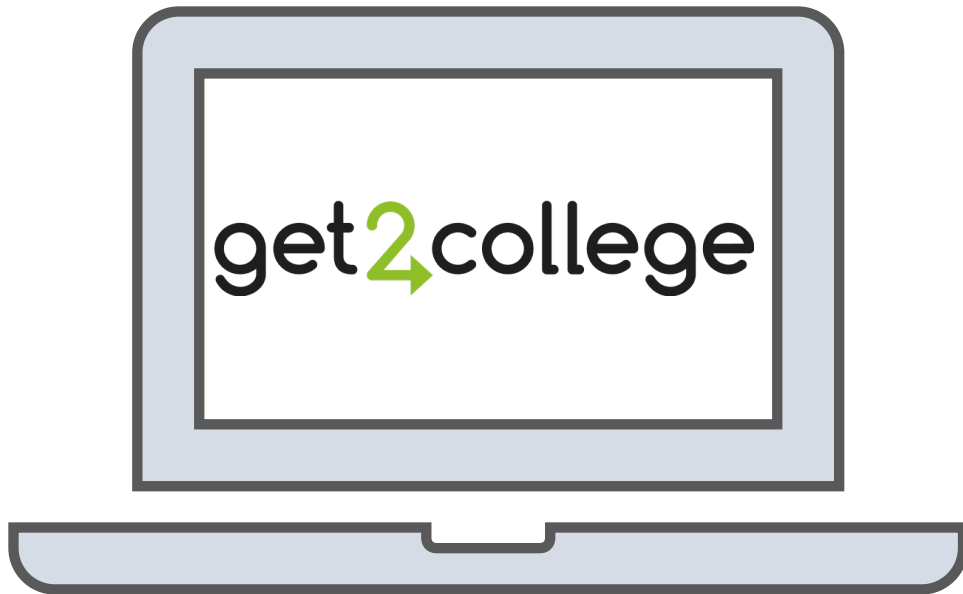- Test-taking strategies, and
- What to expect on test day.

Additional online ACT® prep materials available are:

- Free ACT® Official Online Practice Test, with User Guide
- Free ACT® Math practice test questions, and
- Free Live Online Trial Classes

NOTE: Click the image to access the video, and [here](#) to access the complete Youtube playlist.

- Get2College Prep Podcast for the ACT®

- Get2College Guidebook for the ACT®

- Get2College Pre-Workshop Quiz for the ACT®

- Get2College Workshop Powerpoint for the ACT®

- Get2College Post-Workshop Sheet for the ACT®

- Get2College Team 36: Studying for the ACT®.

Kaplan offers three, free ACT® prep options:

- ACT Half-length Practice Test,
- ACT Pop Quiz
- ACT Question of the Day

Rocket City Learning Center offers access to previous ACT® Practice Tests :

- **ACT Practice Test 2018-19 (Form 74FPRE)**

- **ACT Practice Test 2015-16 (Form 72CPRE)**

- **ACT Practice Test 2014-15 (Form 67C)**

- **ACT Practice Test 2011-12 (Form 64E)**

- **ACT Practice Test 2008-09 (Form 61C)**

- **ACT Practice Test 2005-06 (Form 59F)**

Rocket City Learning Center

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ACT® Mathematics

Fall 2023

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