

## How Can I Prepare?

- ◆ Review and practice your **mathematics skills**.
- ◆ Search the internet for lessons on mathematical terms or concepts found here. **Terms highlighted in green** can be used for internet searches.
- ◆ Find free learning material on the internet. If a lesson seems too challenging or confusing, try a different website, or you may want to study a different topic first.
- ◆ Read the TASC test sample items available at [www.tasctest.com](http://www.tasctest.com)
- ◆ Get test-taking tips from the TASC test website: [www.tasctest.com](http://www.tasctest.com)
- ◆ Use the TASC test blog at: [www.tasctest.com](http://www.tasctest.com)
- ◆ Find a free High School Equivalency Preparation Program at: <http://www.acces.nysed.gov/hse/hse-prep-programs-maps>
- ◆ Find a TASC Test Center at: <http://www.acces.nysed.gov/hse/hse-testing-maps>
- ◆ Get to know the calculator: <https://education.ti.com/en/products>

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New York State  
Education  
Department



TEST  
ASSESSING  
SECONDARY  
COMPLETION™

## The New York State High School Equivalency Test

### Examinee Guide to the Test Assessing Secondary Completion™ TASC Test Math Subtest



The TASC Math Subtest is one of the five subject area tests (Reading, Writing, Mathematics, Science and Social Studies) required for the High School Equivalency (HSE) Diploma. The test measures national educational standards, and is available in paper-based or computer-based formats. This guide provides an overview of the TASC Math Subtest.

**Highlighted terms** in this brochure can be used for internet searches to find free study materials.

The test is in two parts. Part I allows use of a calculator, Part II does not. You have 90 minutes to answer around 55 questions; most are multiple-choice, with a few gridded-response items.

When you take the test, you may find some difficult questions, but do not get discouraged. Do your best to answer all of the questions.

## What to Know

This guide shows some broad topic areas and provides examples of math that may be on this test. It does not include every type of problem. Below, find several math formulas, concepts and terms to know and understand.

## Formulas, Concepts, and Terms

### Formulas

Finding Distance, Rate, or Time ( $d = rt$ )

Simple Interest Problems ( $I = prt$ )

Pythagorean Theorem ( $a^2 + b^2 = c^2$ )

### Area Formulas:

Area of a rectangle ( $A = lw$ )

Area of a triangle ( $A = \frac{1}{2}bh$ )

Area of a circle ( $A = \pi r^2$ )

Volume of a rectangular prism or box ( $V = lwh$ )

### Concepts

- ◆ Rounding numbers to a specific place value
- ◆ Finding the slope of a line
- ◆ Plot points on a graph
- ◆ Function notation
- ◆ Understanding the relationship of lengths, areas, and volume
- ◆ Rational versus irrational numbers
- ◆ Evaluate functions for a given value

### Terms

average rate of change  
cone  
congruent  
coordinates  
cylinder  
density  
difference  
dilations  
domain of a function  
horizontal  
integers  
maximum  
mean (average)  
median  
minimum  
origin  
coefficient  
parallel  
perpendicular

Pi ( $\pi$ , approximately 3.14)  
product  
pyramid  
quotient  
range of a function  
reflections  
relative frequency  
right angle  
rotations  
sampling bias  
spheres  
sum  
survey  
symmetry  
transformations  
translations  
vertex  
vertical  
vertices

## Calculator and Math Reference Sheets

A TI-30XS calculator will be provided for the test. You may *not* use your own calculator. The calculator has many scientific functions. One way to become familiar with the calculator before taking the TASC test is to visit [www.tasctest.com](http://www.tasctest.com) to see both the Calculator and Math Reference Sheets.

## Passing Scores for the TASC Math Subtest

The passing score is 500 for each TASC subtest—plus a minimum score of 2 on the Writing Subtest essay. You pass the TASC test when you pass each of the five subtests.

## About the Examples:

The TASC Math Subtest measures high school-level math skills. Many of the questions require using multiple steps and skills, and applying the information to real-world situations. The examples in this brochure show skills used to answer TASC Math Subtest questions.



## Locate a Prep or Test Center at

[http://www.acces.nysed.gov/  
what-hsetasc-test](http://www.acces.nysed.gov/what-hsetasc-test)

At this website, find information about how to register for the TASC test and earn your High School Equivalency Diploma. There is also information about how to get help with preparing to take the HSE exam. Many preparation programs offer free classes.

# TASC Test Mathematics Content Areas

Highlighted terms in this brochure can be used for internet searches to find free study materials. (Not all of the TASC test content is covered here, but this should give you some good ideas about what to study).

## Number and Quantity (13% of the items)

Convert between fractions, decimals, and percents:

$$1.4 = \frac{14}{10} = 1\frac{2}{5} = 140\%$$

Order fractions, decimals, negative numbers, and square roots:

$$-3 < -2.2 < -\sqrt{3} \qquad -\frac{4}{15} < 0 < \frac{1}{12} < \frac{1}{5}$$

Add, subtract, multiply, and divide fractions:

$$\frac{2}{3} + \frac{4}{5} = \frac{10}{15} + \frac{12}{15} = \frac{22}{15} = 1\frac{7}{15}$$

$$1\frac{3}{5} \div 1\frac{1}{3} = \frac{8}{5} \div \frac{4}{3} = \left(\frac{8}{5}\right)\left(\frac{3}{4}\right) = \frac{24}{20} = 1\frac{4}{20} = 1\frac{1}{5}$$

Add, subtract, multiply, and divide decimals:

$$1.5 \cdot 0.0003 = (1.5)(0.0003) = 0.00045$$

Add, subtract, multiply, and divide negative numbers:

$$\begin{aligned} -3 + 45 &= 42 & -8 \div 2 &= -4 \\ -8 - 5 &= -13 & (-4)(-2.1) &= 8.4 \end{aligned}$$

Evaluate an expression using the order of operations:

(Parenthesis, Exponents, Multiply and Divide, Add and Subtract, or simply, PEMDAS)

$$12 - (2)(4) + (1 - 6) = 12 - (2)(4) + (-5) = 12 - 8 - 5 = -1$$

Distinguish whole numbers, integers, rational numbers, and irrational numbers:

Rational numbers can be expressed as a ratio or fraction.

Pi ( $\pi$ ) = 3.14159265... and is an irrational number because it does not end or repeat.

$1\frac{1}{3} = \frac{4}{3} = 1.33333...$  and is a rational number because it can be expressed as a ratio of two whole numbers.

Combining rational and irrational numbers:

**an irrational number + a rational number = an irrational number**

Converting to and from scientific notation:

$$9.3 \times 10^7 = 93,000,000 \qquad 0.00403 = 4.03 \times 10^{-3}$$

Find Percents:

$$\text{What is 15\% of \$30?} = 0.15(30) = \$4.50$$

In a poll, 12 of 25 people agree. What percent disagree?

$$\frac{12}{25} = 12 \div 25 = 0.48 = 48\% \rightarrow 100\% - 48\% = 52\%$$

Understand square roots and cube roots and determine if they are rational or irrational. Roots can be expressed as radicals or as fractional exponents:

$$\sqrt{25} = 25^{\frac{1}{2}} = 5 \text{ (rational)} \qquad \sqrt{529} = 529^{\frac{1}{2}} = 23 \text{ (rational)}$$

$$\sqrt{3} = 1.7320508... \text{ (irrational)}$$

$$\sqrt[3]{-8} = (-8)^{\frac{1}{3}} = -2$$

$$\text{(because } (-2)^3 = \text{"negative 2 cubed"} = (-2)(-2)(-2) = -8)$$

## Algebra (26%)

Evaluate an algebraic expression for given values:

Evaluate  $2x^3y^2$  when  $x = -2$  and  $y = -3$ .

$$2(-2)^3(-3)^2 = 2(-8)(9) = -144$$

Apply the rules of exponents:

$$(x^3)(x^2) = x^5 \qquad \frac{x^7y^3}{x^3y^6} = \frac{x^4}{y^3} \qquad (3x^4)^3 = 27x^{12}$$

Steps to solve equations:

$$-4(3x - 2) = 2x - 20$$

$$-12x + 8 = 2x - 20$$

$$+12x \quad +12x$$

$$8 = 14x - 20$$

$$+20 \quad +20$$

$$\frac{28}{14} = \frac{14x}{14}$$

$$2 = x$$

Solving formulas for a specific variable:

Solve for  $x$ :

$$8x + 4y = -3$$

$$-4y \quad -4y \text{ (subtract } 4y \text{ from both sides)}$$

$$\frac{8x}{8} = -\frac{4y}{8} - \frac{3}{8} \text{ (divide)}$$

$$x = -\frac{1}{2}y - \frac{3}{8} \text{ (simplify fractions)}$$

Simplify polynomials by combining like terms:

$$3x^2y + 4xy^2 - 8x^2y - 4xy^2 + y^2 = -5x^2y + y^2$$

Multiply and divide monomials:  $\frac{6x^7y^2}{2x^2y} = 3x^5y$

Multiply binomials:  $(x + 5)(x - 8) = x^2 - 3x - 40$

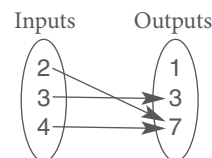
Factor trinomials:  $x^2 - 3x - 28 = (x + 4)(x - 7)$



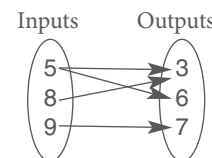
## Functions (26%)

Distinguish functions from non-functions: *Functions show how an input number is matched, or mapped, to an output number. If any input number maps to more than one output number, then the relationship is not a function.*

What is a function?



This is a function.  
Every input maps to a single output.



This is not a function.  
The input "5" maps to two different outputs.

Do these tables represent functions?

Table 1

x	y
2	5
3	6
4	6
5	8

This is a function.  
Every input,  $x$ , maps to a single output,  $y$ .

Table 2

x	y
2	1
4	2
4	3
8	4

This is not a function.  
The input "4" maps to two different outputs.

Evaluate functions for a given value:

Evaluate  $f(5)$ , given  $f(x) = 3x - 8$ .

" $f(5)$ " does not mean " $f$  times 5." This is function notation that means "substitute 5 for  $x$ ."

$$f(x) = 3x - 8$$

$$f(5) = 3(5) - 8 = 15 - 8 = 7$$

If  $g(x) = \frac{1}{2}x + 3$ , find  $g(10)$ .

$$g(10) = \frac{1}{2}(10) + 3 = 5 + 3 = 8$$

Graphing basic functions:

Graph  $f(x) = 2x + 3$

**Tip:** Functions are graphed like equations on an  $x$ - $y$  grid. Use the function value,  $f(x)$ , like the  $y$ .

Average Rate of Change (The same as the slope of the graph.)

Average Rate of Change could represent quantities like miles per hour or the cost per additional unit.

## Geometry (23%)

Find volume:

Find the number of cubic meters in a room that is 12 meters (m) by 10 m by 3 m high.

$$V = (\text{length})(\text{width})(\text{height}) \quad \leftarrow \text{Memorize this formula.}$$

$$V = (12)(10)(3) = 360 \text{ cubic meters (m}^3\text{)}$$

Use volume formulas for pyramid, cylinder, cone, and a sphere: (These formulas are provided on the Mathematics Reference Sheet.)

How many cubic inches will a cylindrical can hold if it is 4 inches tall and has a diameter of 3 inches?

The can is a cylinder.

[ $V$  = volume;  $r$  = radius;  $d$  = diameter;  $h$  = height]

$$r = \frac{d}{2} = \frac{3}{2} = 1.5$$

$$V = \pi r^2 h = (3.14)(1.5)^2(4) = 28.26 \text{ cubic inches (in}^3\text{)}$$

Pythagorean Theorem: Memorize " $a^2 + b^2 = c^2$ ."

**Tip:** This works with right triangles and " $c$ " must be the hypotenuse; the longest side, which is across from the right angle.

The bottom of a twenty-foot ladder is placed 6 feet from a wall. What height will the top of the ladder reach? Round to the nearest tenth of a foot.

$$a^2 + b^2 = c^2$$

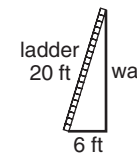
$$a^2 + 6^2 = 20^2$$

$$a^2 + 36 = 400$$

$$-36 \quad -36$$

$$a^2 = 364$$

$$a = \sqrt{364} \approx 19.078 \approx 19.1 \text{ feet}$$



## Statistics and Probability (12%)

Probabilities as fractions, decimals, and percentages:

What is the probability of winning a lottery drawing with 200 tickets if you buy 5 tickets?

$$\frac{5}{200} = 1/40 = 0.025 \text{ (This means there is a 2.5\% chance of winning the lottery if you buy 5 tickets.)}$$

Probabilities for multiple events ("and" and "or")

The probability of rolling a "four" is 1/6. The probability of rolling an "odd number" is 1/2.

When rolling a die, what is the probability of a "four" or an "odd number"?

(Add for "or")

$$1/6 + 1/2 = 2/3$$

What is the probability of getting a "four" on one roll of a die, and then an "odd number" on the next roll?

(Multiply for "and")

$$(1/6)(1/2) = 1/12$$