TASC Mathematics – Number & Quantity Content Emphases

Approximately 13% of the Math on the TASC is Number and Quantity.

The following pages list the number and quantity standards assessed on the TASC and a sample question for each standard[1]. Also noted is whether each standard is a high, medium or low emphasis topic on the TASC

The 13% of the TASC that is number and quantity is divided up into the following sub-domains:

- Quantities – 10%
- The Real Number System– 3%

Quantities – 10%

Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. (High Emphasis)

Sample Items: Questions assessing this standard often take the form of "What is the density/speed/rate…?

For example:

(Calculator use is permitted for this item.)

The density of salt is 80 pounds per cubic foot (lb/ft^3).

- 1 pound (lb) is approximately 0.4536 kilogram (kg).
- 1 cubic foot (ft^3) is approximately 0.0283 cubic meter (m^3).

What is the approximate density of salt in kilograms per cubic meter (kg/m^3)?

A. 36 kg/m^3
B. 176 kg/m^3
C. 1282 kg/m^3 (Correct response)
D. 2827 kg/m^3

As with the sample item above:

- Problems will always be in a context and in a word problem.
- Distractors (wrong but plausible answers) will likely be focused on misconceptions involving the units
- Problems will often have quantities given in different units.
- Problems may ask students to analyze proportional relationships and use them to solve real-world and mathematical problems

[1] The sample questions are taken from the TASC Item Specifications made available by DRC/CTB. http://www.acces.nysed.gov/common/acces/files/hse/tasc_2016_item_specifications_mathematics_may2016.pdf

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. (Medium Emphasis)

Students will demonstrate an understanding by choosing units and methods that provide an appropriate level of accuracy and context. Sample Items assessing this standard often take the form of:

- "What is the most appropriate estimate of…?"
- "Explain why a prediction of… is inappropriate in this situation."

For example:

One gallon of paint covers 375 square feet of wall space. How many whole gallons of paint are required for 2,350 square feet?

A. 5
B. 6
C. 7 (Correct response)
D. 8

If you divide 2,350 by 375, you get 6.267. The question is assessing whether students understand the math in the specific context. 6.267 rounds down to six, but in the context of the problem, we would need 7 cans of paint.

As with the sample item above, questions assessing this standard:

- will be in a real-world context.
- have distractors will focus on the degree of accuracy.

Rewrite expressions involving radicals and rational exponents using the properties of exponents. (High Emphasis)

Sample Items:

1. What is the value of $\sqrt{5^4}$?

   A. $\frac{1}{625}$
   B. $\frac{1}{25}$
   C. 25 (Correct response)
   D. 625

2. How is this number written as an exponential expression with a base of five?
3. What is the standard form of this exponential expression?
4. Which of the following numerical expressions is equivalent to $3^2 \cdot 3^{-5}$?
   A. 27
   B. $\frac{1}{27}$ **(Correct response)**
   C. 59049
   D. $\frac{1}{59049}$

As with the sample items above:

- Radicals will be limited to square roots
- Exponents will be limited to integer exponents
- Items may be written to know and apply the properties of integer exponents to generate equivalent numerical expressions

Explain why the sum or product of rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. (Low Emphasis)

Sample Item:

1. Which expression represents a rational/irrational number?
2. Which number can we multiply $\sqrt{2}$ by to get a rational number? **($\sqrt{2}$)**
3. What type of number is the sum of $\sqrt{16}$ and $3\sqrt{64}$?
   - **A. rational; because the sum of two rational numbers is rational**
   - B. rational; because the sum of two irrational numbers is rational
   - C. irrational; because the sum of two rational numbers is irrational
   - D. irrational; because the sum of two irrational numbers is irrational

- Items will only have a single operation (either addition or multiplication)
- Irrational numbers should be easily recognizable (i.e. π or the square root of 2, 3, 5, 7, or 8).

Additional Useful Vocabulary for Students to Know in Number and Quantity[2]

- Irrational number
- Pi (π, approximately 3.14)
- Proportional
- Rational number

[2] According to the Examinee Guide to the Test Assessing Secondary Completion TASC Test Math Subtest