

Problem-Attic's TSIA 2.0 Mathematics Bank

This document shows the organization of questions in the TSIA bank. In particular it shows the subdivision of the Diagnostic and Practice tabs and the *subtopics* for the latter.

The question counts are current as September 20, 2025. Questions are added regularly (and some are moved around). For up-to-date counts, please refer to the info page in Problem-Attic.

Diagnostic tab

Quantitative Reasoning

- Perform basic math operations with whole numbers and integers, decimals, and fractions [140]
- Round numbers to a given decimal place [32]
- Compare numbers in a variety of forms, including decimals, fractions, and percents [56]
- Compare magnitudes of rational and irrational numbers [42]
- Solve problems with ratios, proportions, and percents [84]
- Solve proportional relationship problems in context (e.g., linear relationships in financial literacy and numeracy) [72]
- Identify, manipulate, and interpret linear equations, inequalities, and expressions [80]

Algebraic Reasoning

- Solve linear equations, inequalities, and systems of linear equations [90]
- Evaluate linear functions [20]
- Solve quadratic and exponential relationship problems in context (e.g., exponential decay/growth, compound interest, and depreciation) [52]
- Identify and manipulate quadratic, polynomial, exponential, rational, and radical equations and expressions [74]
- Solve equations and evaluate functions (e.g., quadratic, polynomial, exponential, rational, and radical) [86]

Geometric and Spatial Reasoning

- Identify common units of measurement [8]
- Identify and define types of angles and shapes [50]
- Convert units within systems of measurement [46]
- Find perimeter, area, surface area and volume using a variety of methods, including estimation [90]
- Use transformations to investigate congruence, similarity, and symmetry [50]
- Apply right triangle relationships and basic trigonometry [60]
- Make connections between geometry and algebraic equations [82]

Probabilistic and Statistical Reasoning

- Sort and count data [14]
- Construct simple graphs and tables [20]
- Compute and interpret probability [68]
- Compute and describe measures of center and spread of data [52]
- Classify data and construct appropriate representations [24]
- Analyze, interpret, and draw conclusions from data [48]

Practice tab

Quantitative Reasoning

- Perform basic math operations with whole numbers and integers, decimals, and fractions
 - Integers [118]
 - Decimals [50]
 - Rational numbers [56]
 - Operations involving money [54]
 - Operations in other contexts [68]
- Round numbers to a given decimal place
 - Whole numbers, decimals and currency [28]
 - Estimation [8]
 - Rounding in real world context [12]
- Compare numbers in a variety of forms, including decimals, fractions, and percents
 - Identify rational numbers [6]
 - Convert numbers [56]
 - Convert numbers in real world context [8]
- Compare magnitudes of rational and irrational numbers
 - Least, greatest and absolute value [20]
 - Compare magnitude of numbers [36]
 - Magnitude of numbers in real world context [6]
- Solve problems with ratios, proportions, and percents
 - Operations with percents [26]
 - Percent problems in real world context [46]
 - Ratios and proportionality [40]
- Solve proportional relationship problems in context (e.g., linear relationships in financial literacy and numeracy)
 - Unit rates and proportions [78]
 - Multistep and advanced applications [16]
 - Scale models and maps [8]
- Identify, manipulate, and interpret linear equations, inequalities, and expressions
 - Expressions [142]
 - Evaluate linear equations and inequalities [14]
 - Verify statements about real numbers [10]
 - Write expression for given situation [30]

Algebraic Reasoning

- Solve linear equations, inequalities, and systems of linear equations
 - First degree equations with one variable [74]
 - Inequalities with one variable [34]
 - Inequalities on the coordinate plane [20]
 - Linear systems [32]
 - Write equation, inequality or system [12]
 - Linear equations, inequalities, systems in real world context [30]
- Evaluate linear functions
 - Input and output values [16]
 - Identify function from table or graph [10]
 - Interpret functions in real world context [24]

- Solve quadratic and exponential relationship problems in context (e.g., exponential decay/growth, compound interest, and depreciation)
 - Motion and trajectories [12]
 - Other problem-solving [8]
 - Exponential growth and decay [54]
- Identify and manipulate quadratic, polynomial, exponential, rational, and radical equations and expressions
 - Negative exponents [18]
 - Rational expressions [54]
 - Radical expressions [64]
 - Relations and functions [36]
 - Graphs [64]
- Solve equations and evaluate functions (e.g., quadratic, polynomial, exponential, rational, and radical)
 - Evaluate non-linear equations and formulas [14]
 - Solve equations for specific variable [18]
 - Functions [28]
 - Quadratic equations [48]
 - Absolute value equations [16]
 - Exponential equations [16]
 - Rational equations [22]
 - Radical equations [16]
 - Miscellaneous [30]

Geometric and Spatial Reasoning

- Identify common units of measurement
 - Determine appropriate units [10]
 - Evaluate mixed units [8]
- Identify and define types of angles and shapes
 - Identify shapes [14]
 - Define and measure angles [28]
 - Angle measures of triangles and polygons [44]
- Convert units within systems of measurement
 - Metric units [16]
 - English units [12]
 - Convert units in real world context [12]
 - Problems involving time [14]
 - Operations with units [48]
- Find perimeter, area, surface area and volume using a variety of methods, including estimation
 - Length and perimeter [28]
 - Area of 2-dimensional shapes [20]
 - Surface area and volume [34]
 - Mixed perimeter, area, volume with applications [42]
 - Circles, cylinders, cones and spheres [52]
- Use transformations to investigate congruence, similarity, and symmetry
 - Transformations of shapes and solids [10]
 - Symmetry [16]
 - Similarity [26]
 - Ratios and scaling [10]

- Corresponding parts of congruent shapes [12]
- Prove triangles are congruent [20]
- Apply right triangle relationships and basic trigonometry
 - Right triangle relationships [34]
 - Right triangles in real world context [12]
 - Special triangles (30-60-90 and 45-45-90) [18]
 - Trigonometric ratios [26]
- Make connections between geometry and algebraic equations
 - Identify and calculate slope [24]
 - Graphs of linear equations [14]
 - Write the equation of a line [30]
 - Points on a line [16]
 - Parallel and perpendicular lines [28]
 - Midpoint and distance [38]
 - Other problem-solving on a coordinate plane [26]

Probabilistic and Statistical Reasoning

- Sort and count data
 - Simple ordering (factorials) [8]
 - Combinations and permutations [18]
- Construct simple graphs and tables
 - Represent tabular data as graphs [20]
 - Represent graphical data as tables [14]
 - Other graphical forms [8]
- Compute and interpret probability
 - Determine probability from data set [12]
 - Probability of single events [30]
 - Probability of multiple events [30]
- Compute and describe measures of center and spread of data
 - Range [4]
 - Arithmetic mean (average) [18]
 - Median [6]
 - Mode [10]
 - Multistep and advanced applications [22]
- Classify data and construct appropriate representations
 - Classify types of data [16]
 - Represent data visually [24]
- Analyze, interpret, and draw conclusions from data
 - Interpret tables and graphs [62]
 - Interpolation, extrapolation and trends [8]
 - Sets and set notation [22]

Other Topics

- Numbers and operations
 - Number lines [22]
 - Divisibility and factors [24]
 - GCM and LCM [14]
 - Scientific notation [46]

Algebra and Functions

Logarithms [62]

Geometry and Measurement

Cartesian coordinates [16]

Circles: tangents, secants, chords and arcs [62]

Conics [4]

Probability and Statistics

Stem-and-leaf and box-and-whisker plots [16]

Venn diagrams [8]