

STRATEGY SUMMARY

MATH MULTIPLE-CHOICE STRATEGIES

My Notes

When approaching a Math: Multiple-Choice item, you should pay careful attention to several things:

1. **Figures:** Unless otherwise specifically noted, the figures included as illustrations are drawn to scale.
2. **Answer Choices:** Most answer choices are arranged in order of ascending or descending value and many incorrect answer choices correspond to conceptual errors.
3. **“Signal” Words:** “Signal” words such as thought-reversers (e.g., not, cannot, except) or specified units may be capitalized, underlined, or italicized. These words are critical to correctly understanding the item. Pay careful attention to thought-reversers, as they reverse the apparent meaning of an item.
4. **Ladder of Difficulty:** For each group of Multiple-Choice items in a Math test section, the difficulty level increases as the item number increases. Therefore, allot less time for earlier items. When solving items that are high on the ladder of difficulty, do NOT expect obvious answers or easy solutions. It is unlikely that answers corresponding to easy solutions or to numbers in the item stem will be the correct choice. Remember to pace yourself—difficult, time-consuming items have the same value as the easy items.
5. **Preview Item Stems:** Read the item stem first. Only then should you read the details of the item, keeping this item stem in mind.
6. **Confirm Solutions:** Double-check the solution by confirming that it answers the particular question that is being asked. When applicable, this confirmation includes verifying that the solution is given in the units specified by the item stem. If you are unable to either find an elegant (quick) solution or solve the item directly based on subject knowledge, the following alternative solutions strategies can be extremely helpful.

ALTERNATIVE CONTENT STRATEGIES

My Notes

If you are unable to either find an elegant (quick) solution or solve the item directly based on subject knowledge, the following alternative solutions strategies can be extremely helpful:

1. **“Test-the-Test” Strategy:** The correct answer to any item is always one of four given choices. Sometimes, the easiest and quickest way to solve an item is to test each of the answer choices. The “test-the-test” strategy can mean plugging answer choices back into the item—starting with (C)—to test the validity of an expression, or it can mean checking each answer choice against any stated conditions. The “test-the-test” strategy is typically useful for items with numerical solutions or variables and values that meet stated conditions.
2. **“Plug-and-Chug” Strategy:** This strategy is similar to the “test-the-test” strategy because the item stem and answer choices (rather than direct mathematical solution strategies) are used to isolate the correct answer. The difference is that rather than testing the validity of each answer choice against the item stem conditions, the item stem and/or answer choices are evaluated by plugging in chosen numbers: “plug-and-chug.” This strategy is especially helpful when solving Algebra items.
3. **“Eliminate-and-Guess” Strategy:** If unable to determine the correct answer directly by using mathematical methods or indirectly by using either the “test-the-test” or “plug-and-chug” strategy, eliminate as many answer choices as possible and then guess from the remaining answer choices. For difficult mathematics items, eliminate answer choices that can be reached either by a single step or by copying a number from the item.

CHECKLIST OF SKILLS AND CONCEPTS

My Notes

Heart of Algebra

- Solving Linear Equations and Inequalities
- Creating Linear Expressions, Equations, Functions, and Inequalities
- Interpreting Linear Expressions, Equations, Functions, and Inequalities
- Creating, Solving, and Interpreting Simultaneous Equations and Inequalities

Heart of Algebra: Graphs

- The Coordinate System
- Slope of a Line
- Slope-Intercept Form of a Linear Equation
- Distance Formula
- Graphing First-Degree Inequalities

Passport to Advanced Math

- Manipulating Expressions (Simplifying, Rational, Factoring, Exponential)
- Solving Equations and Inequalities (Rational, Radical, Exponential)
- Solving Quadratic Equations
- Solving Systems with Quadratic Equations
- Creating and Interpreting Quadratic Equations and Functions
- Graphs of Quadratic Functions and Circles
- Solving Polynomial Equations
- Graphs of Polynomial Functions
- Creating and Interpreting Exponential Functions
- Transformations and Compositions of Functions

Data Analysis and Problem Solving

- Data Representations (Bar, Cumulative, and Line Graphs; Pie Charts; Tables; Scatterplots)
- Averages (Simple, Weighted), Median, Mode, Range, Standard Deviation
- Statistical Data Representations (Histograms, Box and Whisker Plots, Frequency Tables, Dot Plots)
- Data Interpretation (Drawing Inferences, Data Collection Methods)
- Probability (Arithmetic, Geometric)
- Ratios (Two-Part, Three-Part, Weighted)
- Proportions (Direct, Indirect)
- Percentages (Change, Original Amount, Price Increase)

CHECKLIST OF SKILLS AND CONCEPTS

My Notes

Additional Topics

- Absolute Value
- Complex Numbers
- Lines and Angles (Perpendicular, Parallel, Intersecting, Big Angle/Little Angle Theorem)
- Triangles (Equilateral, Isosceles, Acute, Obtuse, Perimeter, Area, Altitudes, Angles, Bisectors, Pythagorean Theorem)
- Quadrilaterals (Squares, Rectangles, Rhombuses, Parallelograms, Trapezoids, Perimeter, Area)
- Circles (Chords, Tangents, Radius, Diameter, Circumference, Area)
- Solids (Cubes, Cylinders, Spheres, Volumes, Surface Areas)
- Complex Figures
- Trigonometry (Right Triangles, Angle Measures, Arc Length, Unit Circle)