



Lakeshore Technical College

10-804-113 College Technical Mathematics 1A

Course Outcome Summary

Course Information

Alternate Title	College Technical Math 1A
Description	Topics include: solving linear equations; graphing; percent; proportions; measurement systems; computational geometry; and right triangle trigonometry. Emphasis will be on the application of skills to technical problems. Successful completion of College Technical Mathematics 1A and College Technical Mathematics 1B is the equivalent of College Technical Mathematics 1.
Total Credits	3
Total Hours	54

Pre/Corequisites

Prerequisite 10-834-110 Elementary Algebra w Apps or 31-457-318 Industrial Maintenance Trades Math or 31-420-320 Machine Tool Math or equivalent.

Course Competencies

1. Perform basic operations with real numbers

Assessment Strategies

1.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 1.1. perform the arithmetic operations in proper sequence
- 1.2. simplify expressions using the laws of exponents
- 1.3. evaluate numeric expressions containing exponents
- 1.4. convert numbers between decimal notation and scientific and/or engineering notation
- 1.5. perform arithmetic operations with numbers in scientific notation
- 1.6. calculate powers and roots with numbers in scientific notation
- 1.7. apply skill to technical problems
- 1.8. utilize appropriate technology
- 1.9. apply the process for solving technical problems according to the problem-solving criteria (i.e. show work in a clear and logical manner, verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)
- 1.10. express angles in radian, degree, or revolution measurement

2. Solve linear equations

Assessment Strategies

2.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 2.1. solve linear equations in one variable
- 2.2. rearrange a formula to solve for an indicated first-degree variable
- 2.3. represent unknown(s) with a variable and translate English phrases into equations
- 2.4. substitute given number for variables into formula or equation
- 2.5. apply skill to technical problems
- 2.6. utilize appropriate technology
- 2.7. apply the process for solving technical problems according to the problem-solving criteria (i.e. show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

3. Solve problems using percent and proportion

Assessment Strategies

- 3.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 3.1. perform conversions among fractions, decimals, and percent
- 3.2. write an equation representing the problem
- 3.3. solve the equation
- 3.4. apply skill to technical problems
- 3.5. utilize appropriate technology
- 3.6. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

4. Solve variation problems

Assessment Strategies

- 4.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 4.1. identify the type of variation
- 4.2. write the variation equation
- 4.3. solve direct variation problems
- 4.4. solve inverse variation problems
- 4.5. solve joint and combined variation problems
- 4.6. apply skill to technical problems
- 4.7. utilize appropriate technology
- 4.8. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

5. Graph algebraic functions

Assessment Strategies

- 5.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 5.1. determine ordered pairs from a given graph
- 5.2. differentiate a function from a relation
- 5.3. utilize function notation
- 5.4. identify range and domain of a given function
- 5.5. graph linear and quadratic functions on the Cartesian plane
- 5.6. apply skill to technical problems
- 5.7. utilize appropriate technology

- 5.8. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

6. Relate the equation of a line to its graph

Assessment Strategies

- 6.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 6.1. calculate the distance between two points
- 6.2. calculate the slope of a line given two points on the line
- 6.3. determine the slope of a line parallel to a given line
- 6.4. determine the slope of a line perpendicular to a given line
- 6.5. write the equation of a line using the slope-intercept form, the point-slope form, or the two-point form
- 6.6. apply skill to technical problems
- 6.7. utilize appropriate technology
- 6.8. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

7. Convert units of measure

Assessment Strategies

- 7.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 7.1. convert within SI (metric)
- 7.2. convert within USCS (United States Customary System)
- 7.3. convert between USCS and SI units
- 7.4. apply skill to technical problems
- 7.5. utilize appropriate technology
- 7.6. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

8. Compute angle measures, length of sides, perimeter, and area of plane geometric figures

Assessment Strategies

- 8.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 8.1. calculate the measure of the specified angle(s) of polygons
- 8.2. calculate the circumference, perimeter, and area of plane figures including composite figures
- 8.3. calculate a specified side of similar polygons
- 8.4. apply skill to technical problems
- 8.5. utilize appropriate technology
- 8.6. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

9. Calculate surface area, volume, and weight/mass

Assessment Strategies

- 9.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 9.1. calculate the surface area of solids

- 9.2. calculate the volume of solids
- 9.3. identify the density of a given material
- 9.4. calculate the weight/mass of a solid or liquid
- 9.5. apply skill to technical problems
- 9.6. utilize appropriate technology
- 9.7. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)

10. Solve right triangles

Assessment Strategies

- 10.1. in an oral, written, or graphic product

Criteria

Criteria: Performance will be satisfactory when you:

- 10.1. use the angle-sum principle to compute the third angle of a triangle
- 10.2. use the Pythagorean Theorem to compute a side of a right triangle
- 10.3. use sine, cosine, and tangent ratios to compute sides and/or angles of right triangles
- 10.4. apply skill to technical problems such as vectors
- 10.5. utilize appropriate technology
- 10.6. apply the process for solving technical problems according to the problem-solving criteria (i.e. you show work in a clear and logical manner, you verify the solution, solution is within stated range and reflects appropriate accuracy or precision, solution is labeled with appropriate units)