



Western Technical College

10804114 College Technical Mathematics (CTM) 1B

Course Outcome Summary

Course Information

Description	This course is a continuation of College Technical Mathematics 1A. Topics include: performing operations on polynomials; solving quadratic and rational equations; formula rearrangement; solving systems of equations; and oblique 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.
Instructional Level	Associate Degree Courses
Total Credits	2
Total Hours	36

Textbooks

Basic Technical Mathematics (Looseleaf). 11th Edition. Copyright 2018. Washington, Allyn J. Publisher: Pearson. **ISBN-13**: 978-0-13-443579-4. Required.

Learner Supplies

Scientific calculator - \$10-20. **Vendor**: Campus Shop. Required.

Webcam. **Vendor**: Campus Shop. Required for Online class only.

Success Abilities

1. Cultivate Passion: Expand a Growth-Mindset
2. Live Responsibly: Develop Resilience
3. Live Responsibly: Foster Accountability
4. Refine Professionalism: Improve Critical Thinking

Course Competencies

1. **Perform operations on polynomials.**
Assessment Strategies

1.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 1.1. you add, subtract, multiply, and divide polynomials.
- 1.2. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 1.a. Add, subtract, multiply, and divide polynomials.
- 1.b. Utilize appropriate technology.
- 1.c. Show work in a clear and logical manner.
- 1.d. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 1.e. Solution is labeled with appropriate units.

2. Factor algebraic expressions.

Assessment Strategies

2.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 2.1. you factor using the greatest common factor.
- 2.2. you factor binomials and trinomials .
- 2.3. you solve technical mathematical problems.
- 2.4. you use appropriate technology.
- 2.5. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 2.a. Factor using the greatest common factor.
- 2.b. Factor binomials and trinomials.
- 2.c. Apply skill to technical problems.
- 2.d. Utilize appropriate technology.
- 2.e. Show work in a clear and logical manner.
- 2.f. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 2.g. Solution is labeled with appropriate units.

3. Solve quadratic equations over the set of real numbers.

Assessment Strategies

3.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 3.1. you identify coefficients of a quadratic equation in standard form.
- 3.2. you select appropriate method for solving second degree equations.
- 3.3. you generate the equation which satisfies the conditions of the problem.
- 3.4. you solve second degree equation using the selected method.
- 3.5. you select relevant solution(s).
- 3.6. you solve technical mathematical problems.
- 3.7. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 3.a. Identify coefficients of a quadratic equation in standard form.
- 3.b. Select appropriate method for solving second degree equations.
- 3.c. Generate the equation which satisfies the conditions of the problem.
- 3.d. Solve second degree equation using the selected method.
- 3.e. Select relevant solution(s).
- 3.f. Apply skill to technical problems.
- 3.g. Utilize appropriate technology.
- 3.h. Show work in a clear and logical manner.
- 3.i. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 3.j. Solution is labeled with appropriate units.

4. Perform operations with rational expressions.

Assessment Strategies

4.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 4.1. you add, subtract, multiply, and divide rational expressions.
- 4.2. you apply skill to an applied technical problem.
- 4.3. you simplify complex fractions.
- 4.4. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 4.a. Add, subtract, multiply, and divide rational expressions.
- 4.b. Simplify complex fractions.
- 4.c. Apply skill to an applied technical problem.
- 4.d. Utilize appropriate technology.
- 4.e. Show work in a clear and logical manner.
- 4.f. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 4.g. Solution is labeled with appropriate units.

5. Solve rational equations.

Assessment Strategies

5.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 5.1. you apply multiplication property to clear all denominators.
- 5.2. you solve equations.
- 5.3. you identify extraneous solutions.
- 5.4. you solve technical mathematical problems.
- 5.5. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 5.a. Apply multiplication property to clear all denominators.
- 5.b. Solve equations.
- 5.c. Identify extraneous solutions.
- 5.d. Apply skill to technical problems.
- 5.e. Utilize appropriate technology.
- 5.f. Show work in a clear and logical manner.
- 5.g. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 5.h. Solution is labeled with appropriate units.

6. Solve systems of equations.

Assessment Strategies

6.1. in an oral, written, or graphic product

Criteria

You will know you are successful when

- 6.1. you solve systems of two and three equations or formulas.
- 6.2. you check all solutions in the system.
- 6.3. you solve technical mathematical problems.
- 6.4. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 6.a. Show work in a clear and logical manner.
- 6.b. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 6.c. Solution is labeled with appropriate units.
- 6.d. Solve systems of two and three equations or formulas.
- 6.e. Check all solutions in the system.

- 6.f. Apply skill to technical problems.
- 6.g. Utilize appropriate technology.

7. Solve oblique triangles.

Assessment Strategies

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

Criteria

You will know you are successful when

- 7.1. you use the Law of Cosines, Law of Sines, and right triangle methods when appropriate.
- 7.2. you apply skill to technical problems such as vectors.
- 7.3. you relate angle in standard position to its reference angle.
- 7.4. you apply the process for solving technical problems according to the problem-solving criteria.

Learning Objectives

- 7.a. Use the Law of Cosines, Law of Sines, and right triangle methods when appropriate.
- 7.b. Relate angle in standard position to its reference angle.
- 7.c. Apply skill to technical problems such as vectors.
- 7.d. Utilize appropriate technology.
- 7.e. Show work in a clear and logical manner.
- 7.f. Verify the solution: solution is within stated range and reflects appropriate accuracy or precision.
- 7.g. Solution is labeled with appropriate units.