Adult Basic Education (ABE)

Level III Mathematics

Mathematics 1102B

Getting Paid/Angles

Curriculum Guide

Student Resource: *Math at Work 10. McGraw-Hill Ryerson. 2011. ISBN 13:978-007109106-0.*

Level III General College Profile Mathematics (General)
Mathematics 1102A: Consumerism and Travel/Measuring Length/Measuring Area
Mathematics 1102B: Getting Paid/Angles
Mathematics 1102C: Pythagorean Relationship/Trigonometry
Mathematics 2102A: Surface Area/Drawing and Design/Volume and Capacity
Mathematics 2102B: Interpreting Graphs/Banking and Budgeting
Mathematics 2102C: Slope/Right Triangles and Trigonometry
Mathematics 3102A: Measurement and Probability/Data/Linear Relationships
Mathematics 3102B: Real-Life Decisions/Properties of Figures
Mathematics 3102C: Transformations/Trigonometry

Newfoundland
Labrador

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General Information

Introduction

Mathematics 1102B when completed with **Mathematics 1102A and C** is equivalent to the Newfoundland and Labrador senior high school **Mathematics 1202 (Applied)** course.

Pre-requisite

Students must have completed **Mathematics 1102A**.

Resources

The student resource for this course is*:*

- *Math at Work 10. McGraw-Hill Ryerson. 2011. ISBN 13:978-007109106-0.*

The instructor resources for this course are:

- *Math at Work 10 Teacher's Resource. McGraw-Hill Ryerson. 2011. ISBN 13:978-007109116-9*
- *The Online Teacher's Resource Centre*
- *Math at Work 10 Teacher's Resource CD-ROM*

Instructors may also supplement with other resources at their discretion.

Study Guide

The Study Guide provides the student with Required Work for the course. It guides the student through the course by assigning relevant reading and exercises from the student resource. Sometimes the Study Guide provides important points for students to think about, to remember or to note. The Study Guide is designed to give students some degree of independence in their work. There is information in the Curriculum Guide applicable to teaching, learning and assessment that is not included in the Study Guide. Instructors should review this information and decide how to use it when teaching students.

Instructors can also exercise professional judgment and make minor alterations to the Required Work in the Study Guide. For example, an instructor may decide that it is unnecessary to assign students all the exercises to complete within each lesson.

Curriculum Guide

The Curriculum Guide includes the specific curriculum outcomes and achievement indicators for the course. The specific curriculum outcomes are listed in numerical order, and the achievement indicators are listed alphabetically. Suggestions for teaching, learning and assessment are also provided to support student achievement of the outcomes. Some of these suggestions will also be repeated in the curriculum guides for other mathematics courses as appropriate. The curriculum guide also states the pre-requisite for each Level III mathematics course.

Mathematics 1102B Outcomes/Achievement Indicators

Unit 1: Getting Paid

1. Demonstrate an understanding of income, including:

    i. wages

    ii. salary

    iii. contracts

    iv. commissions

    v. piecework.

    a) Describe, using examples, various methods of earning income.

    b) Identify and list jobs that commonly use different methods of earning income; e.g. hourly wage, wage and tips, salary, commission, contract, bonus and shift premiums.

    c) Determine in decimal form, from a time schedule, the total time worked in hours and minutes, including time and half and/or double time.

2. Solve problems that require the manipulation and application of formulas related to:

    i. **income**

    ii. area

    iii. the Pythagorean Theorem

    iv. primary trigonometric ratios.

    a) Determine gross pay from given or calculated hours worked given:

    i. the base hourly wage, with and without tips

    ii. the base hourly wage, plus overtime (time and a half, double-time).

    b) Solve a contextual problem that requires the application of a formula that does not require manipulation.

    c) Investigate, with technology, "what if…" questions related to changes in income; e.g., "What if there is a change in the rate of pay?"

    d) Identify and correct errors in a solution to a problem that involves gross or net pay.

    e) Explain why gross pay and net pay are not the same.

    f) Determine the CPP, EI and income tax deductions for a given gross pay.

g) Determine net pay when given deductions.

h) Identify and correct errors in a solution to a problem that involves a formula.

i) Determine gross pay for earnings acquired by: base wage plus commission and single commission rate.

j) Describe the advantages and disadvantages for a given method of earning income; e.g., hourly wage, tips, piecework, salary, commission, contact work.

Unit 2: Angles

1. Demonstrate an understanding of angles, including acute, right, obtuse, straight and reflex by:
    i. drawing
    ii. replicating and constructing
    iii. bisecting
    iv. solving problems.

    a) Measure, using a protractor, angles in various orientations.
    b) Draw and describe angles with various measure, including acute, right, straight, obtuse and reflex angles.
    c) Identify referents for angles.
    d) Sketch a given angle.
    e) Estimate the measure of a given angle, using 22.5^0, 30^0, 45^0, 60^0, 90^0 and 180^0 as referent angles.
    f) Solve a contextual problem that involves angles.
    g) Explain and illustrate how angles can be replicated in a variety of ways.
    h) Replicate angles in a variety of ways, with and without technology.
    i) Bisect an angle, using a variety of methods.

2. Solve problems that involve parallel, perpendicular and transversal lines, and pairs of angles formed between them.
    a) Sort and justify a set of lines as perpendicular, parallel or neither.
    b) Illustrate and describe complimentary and supplementary angles.

c) Identify in a set of angles, adjacent angles that are not complementary or supplementary.

d) Identify and name pairs of angles formed by parallel lines and a transversal, including corresponding angles, vertically opposite angles, alternate interior angles, alternate exterior angles, interior angles on the same side of the transversal, and exterior angles on the same side of the transversal.

e) Explain and illustrate the relationships between the angles formed by parallel lines and a transversal.

f) Determine the measures of angles involving parallel lines and a transversal, using angle relationships.

g) Explain, using examples, why the angle relationships do not apply when the lines are not parallel.

h) Determine if lines or planes are perpendicular or parallel.

i) Solve a contextual problem that involves angles formed by parallel lines and a transversal, including perpendicular transversals.

Recommended Evaluation

Written Notes (Including all the Required Work)   10%

Assignments   30%

Tests/Quizzes   60%

Total   **100%**

Instructors have the discretion to make minor changes to this evaluation scheme.

Unit 1: Getting Paid—Suggestions for Teaching and Learning

- Ensure students are familiar with the terminology related to income calculations.
- Instructors can help students access and use technology (calculators, online tax programs etc.) to compare various income levels. Students can investigate how changes in rate of pay, number of hours worked, increases or decreases in income and/or deductions offset net income.
- Instructors should help students understand error analyses. In addition to providing correct solutions, students should be able to determine incorrect solutions.
- Ensure students show all calculations.
- Encourage students to research the three mandatory government deductions—CPP, EI and income tax. Information on these deductions is available on the Government of Canada website.
- Discuss with students optional deductions such as company health and pension plans, union fees, etc.
- Discuss with students the possible advantages and disadvantages of various income earning methods such as hourly wage, salary, commission, bonus etc.

Unit 1: Getting Paid—Suggestions for Assessment

- Instructors can use the BLM's on the CD-ROM to further reinforce the unit concepts.
- The BLM's on the CD-ROM can be useful for developing unit tests and the final exam.
- Instructors have discretion to combine the last unit test with the final exam if beneficial to the student.
- Students must pass the final exam with a minimum grade of 50% to receive credit for this course.
- Instructors should encourage students to reflect on the math concepts in this unit to relate to everyday life.
- Instructors should engage students in discussions to verbalize student thinking on the math concepts.
- Instructors should require students to always show complete calculations with correct units when relevant.
- Instructors can use their own professional judgment to design assessment tools (additional exercises, word problems, assignments, reflections, math journals, etc.) to meet individual student needs.

Unit 2: Angles—Suggestions for Teaching and Learning

- Students may be interested in knowing that the angle is one of the most common home construction calculations in addition to length.
- Ensure that students understand how to measure angles using a protractor.
- Ensure that students understand how to classify angles as acute, right, straight, obtuse and reflex.
- Ensure that students understand how to construct angles accurately. This can be done using a variety of techniques such as a compass and ruler, a protractor, a set square or rafter angle square.
- Discuss or demonstrate how to construct and cut a 30 degree angle on a piece of wood with a rafter square.
- Point out to students that referent angles are commonly used angle measurements such as 22.5^0, 30^0, 45^0, 60^0, 90^0 and 180^0. These angle measures are useful for students to estimate unknown angle measurements.
- Instructors can help students compare these referent angles to real-life situations. For example, cabinet corners are often 90^0 where each 90^0 is made up of two 45^0 degree angles. Also, 22.5^0 angles are often used when installing crown moldings and 45^0 cuts are common when installing baseboards.
- Students should be able to sketch the approximate measures of angles using knowledge of referent angles. For example, sketching a 50^0 angle should be easy because it can be estimated to lie between 45^0 and 60^0.
- Ensure students understand that parallel lines do not intersect each other and that perpendicular lines intersect at 90^0.
- Students should be able to distinguish between parallel and non-parallel lines by inspection.
- Discuss with students where they see parallel and perpendicular lines in real-life.
- Ensure that students are able to identify the different types of angles that are found when parallel lines are cut by a transversal.
- Students can also be given a set of non-parallel lines intersected by a transversal and asked to measure each angle. They should observe that the same angle relationships do not exist as in parallel lines.

Unit 2: Angles—Suggestions for Assessment

- Instructors can use the BLM's on the CD-ROM to further reinforce the unit concepts.
- The BLM's on the CD-ROM can be useful for developing unit tests and the final exam.
- Instructors have discretion to combine the last unit test with the final exam if beneficial to the student.
- Students must pass the final exam with a minimum grade of 50% to receive credit for this course.
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