Western Technical College

10804123 Math with Business Applications

Course Outcome Summary

Course Information

Description	This course covers real numbers, basic operations, linear equations, proportions with one variable, percents, simple interest, compound interest, annuity, apply math concepts to the purchasing/buying process, apply math concepts to the selling process, and basic statistics with business/consumer applications.
Instructional Level	Associate Degree Courses
Total Credits	3
Total Hours	54

Textbooks

Contemporary Mathematics for Business & Consumers – with Access. 9th Edition. Copyright 2020. Brechner, Robert and George Bergeman. Publisher: Cengage Learning. **ISBN-13:** 978-0-357-02649-6. Required.

Learner Supplies

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

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. Solve scenarios using basic math computations.

Assessment Strategies

1.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

1.1. you use real numbers and basic operations to solve business/consumer problems.
1.2. you answer with the precision of terms appropriate to the problem.
1.3. you answer in the correct units of measure and labels.

Learning Objectives

1.a. Apply basic operations to whole numbers, fractions and decimals.
1.b. Translate business/consumer problems to mathematical processes.
1.c. Apply the correct operation to business scenarios which apply whole numbers, fractions, & decimals.
1.d. Identify units and labels within a business/consumer problem.
1.e. Convert to appropriate units where needed.
1.f. Identify place value.
1.g. Round to the appropriate place value.

2. Solve scenarios using algebraic concepts.

Assessment Strategies

2.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

2.1. you identify the unknown with the appropriate variable.
2.2. you write the equation that relates the known information with the appropriate variable.
2.3. you evaluate formulas for given value of the variables.
2.4. you use algebra to solve business/consumer scenarios.
2.5. you perform basic operations with signed numbers.
2.6. you employ the order of operations to simplify an expression.
2.7. you rearrange formulas to solve for a specific variable.
2.8. you solve linear equations.
2.9. you solve proportions.
2.10. you answer with the precision of terms appropriate to the problem.
2.11. you answer in the correct units of measure and labels.

Learning Objectives

2.a. Identify the unknown quantity within a consumer/business scenario.
2.b. Interpret written expressions in mathematical symbols.
2.c. Translate business/consumer problems to mathematical equations/expressions.
2.d. Simplify linear mathematical expressions.
2.e. Implement the algebraic properties of equality on linear equations.
2.f. Apply basic operations to signed numbers.
2.g. Apply the correct order of operations when evaluating numerical expressions.
2.h. Evaluate mathematical expressions for given values.
2.i. Identify a scenario as a proportion.
2.j. Relate a scenario as a proportional equation.
2.k. Apply the means-extremes theorem (cross multiplication) to solve a proportion.

3. Solve percentage scenarios.

Assessment Strategies

3.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

3.1. you convert between percents, decimals, fractions.
3.2. you identify the base, rate, and amount in the problem.
3.3. you compute the base, rate, or amount.
3.4. you use percentages to solve business/consumer scenarios.
3.5. you solve percent increase/decrease scenarios.
3.6. you answer with the precision of terms appropriate to the problem.
3.7. you answer in the correct units of measure and labels.

Learning Objectives

3.a. Convert fractions to decimals and decimals to fractions.
3.b. Convert decimals to percents and percents to decimals.
3.c. Convert fractions and mixed numbers to percents and percent to fractions and mixed numbers.
3.d. Identify the base, rate and portion in a business application or scenario.
3.e. Compute the base, rate and portion in a business application or scenario.
3.f. Identify the amount of increase or decrease in a business application or scenario.
3.g. Compute the percent increase or decrease in a business application or scenario.
3.h. Compute the base in a percent increase or decrease scenario.
3.i. Compute the portion in a percent increase or decrease scenario.

4. Solve simple interest scenarios.

Assessment Strategies

4.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

4.1. you identify the characteristics of simple interest.
4.2. you compute principal, rate, or time using simple interest formula.
4.3. you determine due date of a promissory note.
4.4. you compute maturity value, principal, rate, and time using maturity value formula.
4.5. you determine present and future values.
4.6. you determine the maturity value of a note in which partial payments are made.
4.7. you determine the proceeds of a discount note.
4.8. you determine effective rate of a discount note.
4.9. you determine the proceeds of a note that is discounted before maturity.
4.10. you use simple interest to solve business/consumer scenarios.
4.11. you answer with the precision of terms appropriate to the problem.
4.12. you answer in the correct units of measure and labels.

Learning Objectives

4.a. Identify principal, rate, time and simple interest in a business problem or scenario.
4.b. Apply the simple interest formula to compute principal, rate, time or simple interest in a business problem or scenario.
4.c. Identify the loan date and due date on a promissory note.
4.d. Identify the time of a promissory note in days, weeks, and months.
4.e. Calculate the loan date, the due date of a note or the time of the loan, given two of the three pieces.
4.f. Relate maturity value to principal and simple interest.
4.g. Apply the maturity value formula to compute principal, rate, time, interest or maturity value in a business problem or scenario.
4.h. Identify present value and future value in a business problem or scenario.
4.i. Compare present value to future value in a business problem or scenario.
4.j. Calculate the new maturity value of a loan when partial payments are made
4.k. Calculate the bank discount and proceeds of a discount note.
4.l. Calculate the effective rate.
4.m. Determine the length of the discount period.
4.n. Apply the correct process to calculate the proceeds of a note that is discounted before maturity.

5. Solve compound interest scenarios.

Assessment Strategies

5.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

5.1. you identify the characteristics of compound interest.
5.2. you differentiate between simple and compound interest.
5.3. you determine the number of periods.
5.4. you determine the rate per period.
5.5. you compute compound interest and compound amount.

5.6. you determine present and future values.
5.7. you use compound interest formulas to solve business/consumer scenarios.
5.8. you determine the APY and the APR.
5.9. you answer with the precision of terms appropriate to the problem.
5.10. you answer in the correct units of measure and labels.

Learning Objectives

5.a. Identify the growth of compound interest over time.
5.b. Compare the growth of simple interest and compound interest over time.
5.c. Define the length of a single compound.
5.d. Identify the number of compounds in a single year.
5.e. Identify the annual interest rate.
5.f. Calculate the interest rate divided by the number of period in a year (for the calculator)
5.g. Identify the correct formula for present value or future value of compound interest.
5.h. Differentiate between compound amount and compound interest and principal.
5.i. Calculate compound amount, compound interest and principal.
5.j. Apply the compound interest formula to compute the future value of an account and the interest in a business problem or scenario.
5.k. Apply the present value form of the compound interest formula to compute the present value and/or the interest in a business problem or scenario.

6. Solve annuity scenarios.

Assessment Strategies

6.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

6.1. you identify the characteristics of an annuity.
6.2. you differentiate between the present and future value of an annuity.
6.3. you calculate the amount of a sinking fund payment.
6.4. you calculate the present and/or future values of an annuity.
6.5. you apply annuity calculations to business/consumer scenarios.
6.6. you answer with the precision of terms appropriate to the problem.
6.7. you answer in the correct units of measure and labels.

Learning Objectives

6.a. Determine the number of periods.
6.b. Determine the period rate.
6.c. Determine the difference between future and present values.
6.d. Determine the total amount invested.
6.e. Determine the difference between amortization payments and sinking fund payments.
6.f. Identify if the scenario calls for finding payments over time or a lump sum.
6.g. Determine the appropriate formula for the given business problem or scenario.
6.h. Apply the appropriate formula to determine the Future value, Present value, Sinking fund payment, and Amortization payment in a business problem or scenario.
6.i. Determine the total amount of interest earned or paid in.

7. Apply math concepts to the purchasing/buying process.

Assessment Strategies

7.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

7.1. you calculate trade discounts.
7.2. you calculate net price.
7.3. you differentiate between single and series discounts.
7.4. you express a series discount as a single discount equivalent.
7.5. you determine cash discount period.
7.6. you compute a cash discount.
7.7. you compute partial payment credit.

7.8. you solve business/consumer scenarios involving the purchasing/buying process.
7.9. you answer in the correct units of measure and labels.
7.10. you answer with the precision of terms appropriate to the problem.

Learning Objectives

7.a. Identify who gets and gives trade discounts and when they are used.
7.b. Identify the difference between a trade discount and net price.
7.c. Determine the appropriate formula or percentages to use in the business problem or scenario for finding trade discount amount, net price, the trade discount rate, and list price for a single trade discount.
7.d. Utilize the appropriate formula or percentages to calculate the trade discount , the net price, the list price and the trade discount rate for a single trade discount.
7.e. Calculate the net price factor for a single or series of discounts.
7.f. Determine the appropriate formula or percentages to use in the business problem or scenario for finding trade discount amount, net price, the single equivalent discount rate, and list price for a series of trade discounts.
7.g. Utilize the appropriate formula or percentages to calculate the trade discount , the net price, the list price and the single equivalent discount rate for a series of trade discounts.
7.h. Determine if a cash discount is applicable for the business scenario.
7.i. Calculate the amount due after a cash discount is applied.
7.j. Determine the amount of credit given for a partial payment in a cash discount scenario.
7.k. Determine the discount dates and net dates for ordinary, EOM, ROG, and Extra terms of sale.

8. Apply math concepts to the selling process.

Assessment Strategies

8.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

8.1. you distinguish between markup based on cost and markup based on selling price.
8.2. you compute selling price, cost, or markup based on cost
8.3. you compute selling price, cost, or markup based on selling price.
8.4. you compute sale price, markdown, or original price.
8.5. you solve business/consumer scenarios involving the selling process.
8.6. you answer in the correct units of measure and labels.
8.7. you answer with the precision of terms appropriate to the problem.

Learning Objectives

8.a. Identify if the problem is using a markup based on cost or a markup based on selling price.
8.b. Calculate using the appropriate formulas or percentages the amount of markup, the markup percent, the cost, and the selling price for a markup based on cost scenario.
8.c. Calculate using the appropriate formulas or percentages the amount of markup, the markup percent, the cost, and the selling price for a markup based on selling price scenario.
8.d. Convert a percent markup based selling price to a markup based on cost and vice versa.
8.e. Identify the difference between a markup and a markdown.
8.f. Calculate using the appropriate formula or percentages the amount of markdown, the sale price, the original price and the markdown percent in a business problem or scenario.
8.g. Calculate the sale price after a series of markups and markdowns.
8.h. Calculate the selling price of a perishable goods.

9. Interpret basic statistics.

Assessment Strategies

9.1. Math Assessment with Consumer/Business Applications

Criteria

You will know you are successful when

9.1. you interpret charted data.
9.2. you construct charts/graphs.
9.3. you determine the appropriate chart given the raw data.
9.4. you calculate measures of central tendencies.
9.5. you interpret measures of dispersion.

9.6. you determine the probability of an event involving normally distributed data.
9.7. you use statistics to solve business/consumer scenarios.
9.8. you answer with the precision of terms appropriate to the problem.
9.9. you answer in the correct units of measure and labels.

Learning Objectives

9.a. Use graphical data to gather information.
9.b. Identify the best chart to be used in certain business scenarios.
9.c. Create bar, circle, and line graphs from raw data.
9.d. Create a frequency table from raw data.
9.e. Calculate the mean, median, and mode of data.
9.f. Calculate the mean of grouped data.
9.g. Calculate a weighted mean (such as GPA) using business scenarios.
9.h. Calculate range, variance, and standard deviation.
9.i. Use the normal curve (z-scores) or empirical rule to determine probabilities, percentages and amounts in a business scenario.