

CvSU Vision
The premier university in historic Cavite globally recognized for excellence in character in the development, academics, research, innovation and sustainable community engagement.



Republic of the Philippines
CAVITE STATE UNIVERSITY
Imus Campus
Cavite Civic Center, Palico IV, Imus City, Cavite



(046) 471-6607 / 471-6770

www.cvsu.edu.ph

CvSU Mission
Cavite State University shall provide excellent, equitable and relevant educational opportunities in the arts, science and technology through quality instruction and relevant research and development activities.

It shall produce professional, skilled and morally upright individuals for global competitiveness.

Final Examination, 2nd Semester 2024 - 2025

Bachelor of Science in Computer Science

COSC 110 - NUMERICAL AND SYMBOLIC COMPUTATION

Name: Anarah Jane Faustino
Section.: BCCS 4C

Score: 33/50
Date: 04/14/2025

+2

35/50

GENERAL INSTRUCTIONS: Encircle the letter/s of the best answer/s. NO ERASURES.

1. Maria is developing a mobile application that helps students find the highest score from a list of quiz results. She decides to design a step-by-step process to compare each score and determine the highest one. What computational thinking concept is Maria applying in her approach?
 - a. Abstraction
 - b. Simulation
 - c. Algorithms and Procedures
 - d. Parallelization
2. You're building a math app that helps students simplify algebraic expressions. A student inputs: $(x^2 - 1) / (x - 1)$. To simplify this expression symbolically using SymPy, which method should the app use, and why?
 - a. expand()
 - b. Rational()
 - c. simplify()
 - d. sqrt()
3. In a symbolic computation tutorial, you ask students to create algebraic expressions using variables x and y. One student writes a Python expression but gets an error because the variables are not defined.
 - a. Use simplify() to check the expression
 - b. Define symbols using symbols('x y').
 - c. Use diff() to check if the expression is valid.
 - d. Use Rational() to define x and y as fractions.
4. You are building an app to help students learn calculus by exploring how functions change. A student wants to know the rate of change of $3x + 5$. What SymPy function should be used and why?
 - a. solve()
 - b. limit()
 - c. simplify()
 - d. diff()
5. In your math homework helper, a student enters the equation $x^2 - 5x + 6 = 0$. The app should show the roots of this equation. Which SymPy method should be used? -
 - a. solve()
 - b. simplify()
 - c. expand()
 - d. limit()
6. Your finance modeling app requires precise calculations involving fractional interest rates. A user inputs $1/3 + 1/2$, and you want to avoid decimal approximations. Which SymPy method ensures the result remains an exact fraction?
 - a. Rational()
 - b. simplify()
 - c. solve()
 - d. expand()
7. You're building a chatbot tutor for algebra. A student asks to solve $2x + 3 = 0$. Which SymPy method is used to find the value of x?
 - a. simplify()
 - b. diff()
 - c. solve()
 - d. expand()
8. A student writes a program that multiplies a very large number by a very small number and gets 0 as the result, even though a non-zero value is expected. Which computational issue is this most likely due to?
 - a. Overflow error
 - b. Symbolic approximation
 - c. Underflow or round-off error
 - d. Improper algorithm design
9. A student inputs $\sqrt{8}$ into your symbolic calculator. To help them understand simplification of radicals, which SymPy feature should be used?
 - a. sqrt()
 - b. simplify()
 - c. Rational()
 - d. series()
10. You are creating a feature in a calculus app that finds the area under the curve of x^2 from 0 to 1. Which SymPy function is appropriate, and why?
 - a. diff()
 - b. limit()
 - c. integrate()
 - d. solve()
11. A student is working with a symbolic calculator to simplify the expression $(x^2 - 1)/(x - 1)$ using SymPy. What command should he use to achieve the desired output?
 - a. simplify($(x^2 - 1)/(x - 1)$)
 - b. simplify($(x^2 - 1)/(x - 1)$)

CvSU Vision
The premier university in historic Cavite globally recognized for excellence in character in the development, academics, research, innovation and sustainable community engagement.



Republic of the Philippines
CAVITE STATE UNIVERSITY
Imus Campus
Cavite Civic Center, Palico IV, Imus City, Cavite



☎ (046) 471-6607 / 471-6770
www.cvsu.edu.ph

CvSU Mission
Cavite State University shall provide excellent, equitable and relevant educational opportunities in the arts, science and technology through quality instruction and relevant research and development activities.

It shall produce professional, skilled and morally upright individuals for global competitiveness.

Name: Anarah Jane Faustino
Section: BCCS 4C

Score: 33/50
Date: 04/14/2025

+2

35/50

GENERAL INSTRUCTIONS: Encircle the letter/s of the best answer/s. NO ERASURES.

1. Maria is developing a mobile application that helps students find the highest score from a list of quiz results. She decides to design a step-by-step process to compare each score and determine the highest one. What computational thinking concept is Maria applying in her approach?
 - a. Abstraction
 - b. Simulation
 - c. Algorithms and Procedures
 - d. Parallelization
2. You're building a math app that helps students simplify algebraic expressions. A student inputs: $(x^2 - 1) / (x - 1)$. To simplify this expression symbolically using SymPy, which method should the app use, and why?
 - a. expand()
 - b. Rational()
 - c. simplify()
 - d. sqrt()
3. In a symbolic computation tutorial, you ask students to create algebraic expressions using variables x and y. One student writes a Python expression but gets an error because the variables are not defined.
 - a. Use simplify() to check the expression
 - b. Define symbols using symbols('x y').
 - c. Use diff() to check if the expression is valid.
 - d. Use Rational() to define x and y as fractions.
4. You are building an app to help students learn calculus by exploring how functions change. A student wants to know the rate of change of $3x^2 + 5$. What SymPy function should be used and why?
 - a. solve()
 - b. limit()
 - c. simplify()
 - d. diff()
5. In your math homework helper, a student enters the equation $x^2 - 5x + 6 = 0$. The app should show the roots of this equation. Which SymPy method should be used?
 - a. solve()
 - b. simplify()
 - c. expand()
 - d. limit()
6. Your finance modeling app requires precise calculations involving fractional interest rates. A user inputs $1/3 + 1/2$, and you want to avoid decimal approximations. Which SymPy method ensures the result remains an exact fraction?
 - a. Rational()
 - b. simplify()
 - c. solve()
 - d. expand()
7. You're building a chatbot tutor for algebra. A student asks to solve $2x + 3 = 0$. Which SymPy method is used to find the value of x?
 - a. simplify()
 - b. diff()
 - c. solve()
 - d. expand()
8. A student writes a program that multiplies a very large number by a very small number and gets 0 as the result, even though a non-zero value is expected. Which computational issue is this most likely due to?
 - a. Overflow error
 - b. Symbolic approximation
 - c. Underflow or round-off error
 - d. Improper algorithm design
9. A student inputs $\sqrt{8}$ into your symbolic calculator. To help them understand simplification of radicals, which SymPy feature should be used?
 - a. sqrt()
 - b. simplify()
 - c. Rational()
 - d. series()
10. You are creating a feature in a calculus app that finds the area under the curve of x^2 from 0 to 1. Which SymPy function is appropriate, and why?
 - a. diff()
 - b. limit()
 - c. integrate()
 - d. solve()
11. A student is working with a symbolic calculator to simplify the expression $(x^2 - 1)/(x - 1)$ using SymPy. What command should he use to achieve the desired output?
 - a. simplify($(x^2 - 1)/(x - 1)$)
 - b. simplify($(x^2 - 1)/(x - 1)$)