# Week 2: Assignment 3

**Due by:** 2023-08-11, 20:00 IST

<table>
<thead>
<tr>
<th>Problem</th>
<th><strong>Week 1</strong></th>
<th><strong>Week 2</strong></th>
<th><strong>Week 3</strong></th>
</tr>
</thead>
<tbody>
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<td>1. a.</td>
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<td>5. a.</td>
<td>7. a.</td>
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<td>1. b.</td>
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<td>8. a.</td>
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</tbody>
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- **Problem 1:**
  - a. Solve the system of linear equations:
    - **Week 1:** 3x + 4y = 7, 5x - 2y = 11
    - **Week 2:** 7x - 6y = 13, 2x + 3y = 8
    - **Week 3:** 5x + 2y = 1, 3x - 4y = 7

- **Problem 2:**
  - a. Calculate the area of a rectangle with length 10 units and width 5 units.
  - b. Calculate the perimeter of a square with side length 7 units.

- **Problem 3:**
  - a. Find the value of x in the equation 2x + 3 = 11.
  - b. Find the value of y in the equation 3y - 4 = 5.

- **Problem 4:**
  - a. Graph the function f(x) = 2x^2 - 3x + 1.
  - b. Find the roots of the quadratic equation x^2 - 5x + 6 = 0.

- **Problem 5:**
  - a. Derive the derivative of the function f(x) = x^3 + 2x^2 - 3x + 1.
  - b. Find the integral of the function f(x) = 3x^2 - 4x + 2.

- **Problem 6:**
  - a. Solve the differential equation dy/dx = 2x + 3 with initial condition y(0) = 1.
  - b. Find the solution to the system of differential equations:
    - dx/dt = 2x - y
    - dy/dt = x + 3y

- **Problem 7:**
  - a. Calculate the probability of drawing a red card from a standard deck of 52 cards.
  - b. Calculate the expected value of rolling a fair six-sided die.

- **Problem 8:**
  - a. Find the mean and median of the following data set:
    - 5, 10, 15, 20, 25
  - b. Calculate the standard deviation of the data set:
    - 5, 10, 15, 20, 25

- **Problem 9:**
  - a. Write a short report on the applications of linear algebra in computer science.
  - b. Discuss the importance of understanding basic statistical concepts in data analysis.

- **Problem 10:**
  - a. Solve the system of linear equations:
    - **Week 1:** 3x + 4y = 7, 5x - 2y = 11
    - **Week 2:** 7x - 6y = 13, 2x + 3y = 8
    - **Week 3:** 5x + 2y = 1, 3x - 4y = 7