Assignment-3

The due date for submitting this assignment has passed.

Due on 2021-02-10, 23:59 EST.

1. Consider the following sequence of numbers:
   
   a) 2, 4, 6, 8, ...
   
   b) 1, 3, 5, 7, ...
   
   c) 0, 2, 4, 6, ...

   Determine the next number in each sequence.

2. Consider the following expression:
   
   \[ a_n = 2^n \]

   Find the value of \( a_3 \).

3. Consider the following geometric sequence:
   
   \[ a_n = 3 \cdot 2^n \]

   Find the sum of the first 5 terms.

4. Consider the following arithmetic sequence:
   
   \[ a_n = 1 + (n-1)d \]

   Find the sum of the first 10 terms.

5. Consider the following function:
   
   \[ f(x) = x^2 - 4x + 4 \]

   Find the vertex of the parabola.

6. Consider the following differential equation:
   
   \[ \frac{dy}{dx} = 2x + 3 \]

   Find the general solution.

7. Consider the following integral:
   
   \[ \int_0^1 (2x + 3) \, dx \]

   Evaluate the integral.

8. Consider the following limit:
   
   \[ \lim_{x \to 0} \frac{\sin(x)}{x} \]

   Evaluate the limit.

9. Consider the following matrix:
   
   \[ \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \]

   Find the determinant.

10. Consider the following system of equations:
    
    \[ \begin{align*}
    x + y &= 3 \\
    2x - y &= 1
    \end{align*} \]

    Solve the system.

11. Consider the following probability problem:
    
    A fair die is rolled twice. What is the probability of getting a sum of 7?

    1 point