

MATH18584 Fundamentals of Computer Mathematics

- Assignment #3
- This assignment will be graded out of 40
- This assignment is to be completed individually. Assignments copied in whole or in part will receive a grade of ZERO.
- You must show your work for full marks!
- Answers may only be submitted in the following formats:
 - Microsoft Word Document (.docx)
 - Adobe PDF Document (.pdf)
 - Do not submit external links. Scanned documents need to be legible and in pdf format.

1. List all the members of set A.

$A = \{x \mid -1 < x \leq 2, x \in \mathbb{Z}\}$ Write the power set of A. **(2 marks)**

2. Let $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{0, 2, 4, 6, 8, 10\}$, $B = \{0, 1, 2, 3, 4, 5, 6\}$ and $C = \{4, 5, 6, 7, 8, 9, 10\}$

Evaluate and show all your work. **(2 marks each)**

a. $\overline{(A \cup B)}$

b. $\bar{A} \cap \bar{C}$

c. $A - C$

3. Solve level-2 OR level-3 questions in the below interactive resource and attach a screenshot of the solved page in your answer sheet.

<https://www.transum.org/Maths/Activity/Venn/Exercise.asp?Level=2> **(4 marks)**

4. State the domain and range for the following relation, and state if it is a function.
(3 marks each)

a. $\{(-5,4), (-4, -1), (-2,1), (0,4), (1,3)\}$

Domain:

Range:

Function?

b. $\{(-3, -4), (-1,2), (0,0), (-3,5), (2,4)\}$

Domain:

Range:

Function?

5. Determine the domain and range of each of the following function. **(2 marks each)**

a. $y = \sqrt{2x + 1}$

b. $y = \frac{1}{x+4}$

6. The Ace Telephone Co. charges a flat monthly fee of \$20.00 for a telephone line and \$0.22 per minute for long distance calls.

a. Write an equation that will relate the total cost per month, **C**, to the number of minutes, **m**, of long distance calls that you make. **(2 marks)**

b. If you make 25 minutes of long distance calls per month, what will it cost?
(2 marks)

7. List the first four terms of the following sequence, beginning with $n=0$. **(2 marks)**

$$A_n = \frac{(-1)^{n+1}}{(2n+1)!}$$

8. Evaluate the following summation: **(3 marks each)**

a. $\sum_{n=1}^5 (-1)^{n+1} (2n)$

b. $\sum_{i=5}^{10} 3(-2)^i$

9. Take any one real life application scenario like networking in Facebook, Twitter etc.; movie surfing in Netflix... Construct the graph model and explain the associated terms like type of graph, vertex set, edge set, degree etc. **(6 marks)**