MATHEMATICS

Assignment 1

Index No: ICT/20/851

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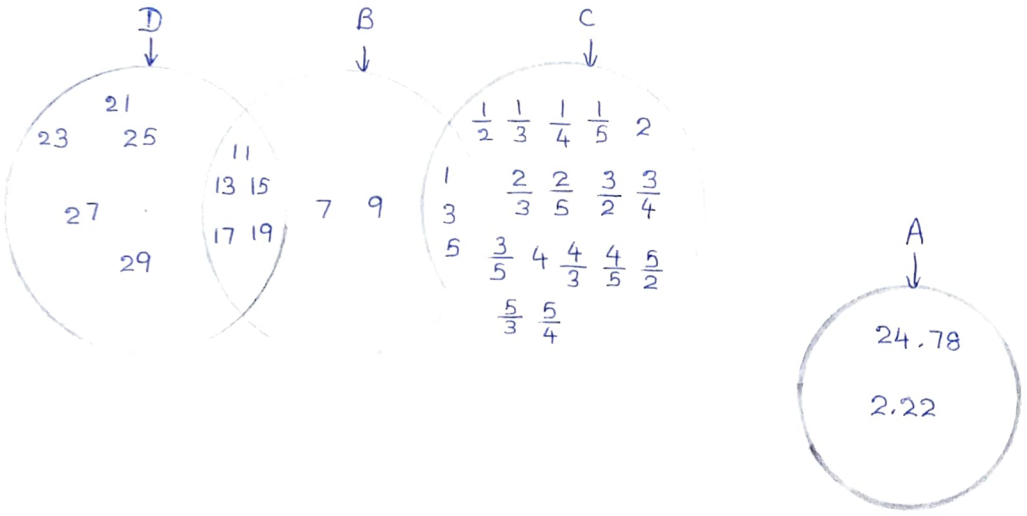
1. A). i) $A = \{24.78, 2.22\}$

ii) $B = \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\}$

iii) $C = \{1, \frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, 2, \frac{2}{3}, \frac{2}{5}, 3, \frac{3}{2}, \frac{3}{4}, \frac{3}{5}, 4, \frac{4}{3}, \frac{4}{5}, 5, \frac{5}{2}, \frac{5}{3}, \frac{5}{4}\}$

iv) $D = \{11, 13, 15, 17, 19, 21, 23, 25, 27, 29\}$



i) $B \cup (A \cap C) = \{1, 3, 5, 7, 9, 11, 13, 15, 17, 19\}$

ii) $A \oplus B = \{1, 2.22, 3, 5, 7, 9, 11, 13, 15, 17, 19, 24.78\}$

iii) $B \oplus D = \{1, 3, 5, 7, 9, 21, 23, 25, 27, 29\}$

iv) $A \cap (B \cap C^c) = \{\}$

v) $(B \cup C)^c = \{2.22, 21, 23, 25, 27, 29, 24.78\}$

B) i) $((A \cap B) \setminus C) \cup (C \setminus (A \cup B))$

ii) $C \cup D$

iii) $(A \cap B) \cup (B \cap C) \cup (A \cup B \cup C \cup D)^c$

2) A) i) $T_n = n^2 + 2n + 1$

$T_1 = 1^2 + (2\times1) + 1 = 4$

$T_2 = 2^2 + (2\times2) + 1 = 9$

$T_3 = 3^2 + (2\times3) + 1 = 16$

$T_4 = 4^2 + (2\times4) + 1 = 25$

ii) $T_n = 8n^2 - n - 1$

$T_1 = (8\times1^2) - 1 - 1 = 6$

$T_2 = (8\times2^2) - 2 - 1 = 29$

$T_3 = (8\times3^2) - 3 - 1 = 68$

$T_4 = (8\times4^2) - 4 - 1 = 123$

B) $T_1 = 1 \quad ; \quad T_2 = 2$

$T_n = 2T_{n-1} + T_{n-2}$

$T_3 = 2(2) + 1 = 5$

$T_4 = 2(5) + 2 = 12$

$T_5 = 2(11) + 5 = 29$

C) $\frac{3}{5}, \frac{7}{8}, \frac{11}{11}, \frac{15}{14}, \frac{19}{17}, \frac{23}{20}, \ldots$

Consider the numerator;

$3, 7, 11, 15, 19, 29, \ldots$

$T_n = a + (n-1)d$

$= 3 + (n-1)4$

$T_n = 4n - 1$

$T_7 = (4\times7) - 1 = 27$

$T_8 = (4\times8) - 1 = 31$

Consider denominator;

$5, 8, 11, 14, 17, 20, \ldots$

$T_n = a + (n-1)d$

$= 5 + (n-1)3$

$= 3n + 2$

$T_7 = (3\times7) + 2 = 23$

$T_8 = (3\times8) + 2 = 26$

i) $T_7 = \frac{27}{23}$

$T_8 = \frac{31}{26}$

ii) numerator $(T_n) = 4n - 1$

denominator $(T_n) = 3n + 2$

$\therefore T_n = \frac{(4n-1)}{(3n+2)}$

3) $u_n = \frac{n-1}{n+1} =$

$u_2 = \frac{(2-1)}{(2+1)} = \frac{1}{3}$

$u_3 = \frac{(3-1)}{(3+1)} = \frac{2}{4}$

$u_4 = \frac{(4-1)}{(4+1)} = \frac{3}{5}$

* When n gets the values larger and larger, the result value become larger also.