

MTH 2215 Practice Test 2 Version 2 - Solutions

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Name _____

Show CLEARLY how you arrive at your answers.

1. List the members of the set: $\{x \mid x \in \mathbb{Z} \text{ and } x \text{ is a multiple of } 3\}$ in roster form:
2. Express the set $\{\text{Alabama, Alaska, Arizona, Arkansas, } \dots, \text{Wisconsin, Wyoming}\}$ using “set builder notation.”
3. Let $A = \{0, 3, 6\}$ and $B = \{2, 4\}$. Compute $A \times B$
4. Let $A = \{0, 3, 6\}$ and $B = \{2, 4\}$. Compute $B \times A$
5. Let $A = \{0, 3\}$; $B = \{2, 4\}$ and $C = \{x, y\}$. Compute $A \times B \times C$

For Exercises 6-10, Sets A, B, C , and U are defined as follows: $A = \{a, b, c, d\}$; $B = \{b, c, d, e, f\}$; $C = \{b, d, f, h, j\}$; $U = \{a, b, c, d, e, f, g, h\}$

6. $A \cap B =$
7. $\bar{A} =$
8. $A \cup C =$
9. $B - C =$
10. $C - B =$
11. For arbitrary sets A and B , give an equivalent expression for $\bar{A} \cup \bar{B}$
12. For arbitrary sets A and B , give an equivalent expression for $\bar{A} \cap \bar{B}$
13. Suppose that the Universal set is $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

Express the set below with bit strings such that the i^{th} bit is 1 if i is in the set, and the i^{th} bit is 0 otherwise.

- (a) $\{1, 3, 4, 7\}$
 - (b) $\{2, 4, 5, 8, 9\}$
14. Using the same universal set as in the last problem, find the set specified by each of these bit strings.
 - (a) 1011101010
 - (b) 0100010111

15. Compute the following values:

(a) $\lfloor 4.01 \rfloor$

(b) $\lfloor 3.99 \rfloor$

(c) $\lfloor 2.0 \rfloor$

(d) $\lfloor -3.99 \rfloor$

(e) $\lfloor -4.01 \rfloor$

16. Compute the following values:

(a) $\lceil 4.01 \rceil$

(b) $\lceil 3.99 \rceil$

(c) $\lceil 2.0 \rceil$

(d) $\lceil -3.99 \rceil$

(e) $\lceil -4.01 \rceil$

17. List the first three terms of the sequence whose n^{th} term is given by:

(a) $a_n = 4n - 3$

(b) $a_n = 5n^2$

18. Given the expressions below, ¹write out the terms of the sums and ²compute the value of the sums

(a) $\sum_{n=1}^4 (4n - 3) =$

(b) $\sum_{n=1}^4 5n^2 =$

19. Compute the double sum: $\sum_{i=1}^3 \sum_{j=1}^2 (2i - j) =$

20. Compute the value of the sum $\sum_{i=0}^6 4 \cdot 2^i$

21. Find the first six terms of the fibonacci sequence defined by the recurrence relation: $a_0 = 1; a_1 = 1; a_n = a_{n-1} + a_{n-2}$ for $n \geq 2$