MATTHAYOM 4 BASIC MATHEMATICS

MIDTERM EXAM TERM 1 /Academic Year 2025

RE TEST

Part 1: Multiple – Choice (40 items)

1. Which of the following best defines a set?

a. an ordered collection of distinct objects
b. a mathematical operation
c. a variable in a programming language
d. a conditional statement

2. Which of the following represents a set?

a. $2x + 5 = -10$
b. $x \geq 5$
c. $y^2 - 2 = 35$
d. $\{1, 2, 3, \ldots\}$

For items 3 – 5, refer to the given below.

Given $A = \{ multiples\ of\ 3\ less\ than\ 30 \}$

3. Which of the following statements is not true?

a. $24 \in A$
b. $10 \in A$
c. $12 \notin A$
d. $30 \notin A$

4. How many elements are there in set A?

a. 10
b. 9
c.11
d. 8

5. Suppose $B \subset A$. Which of the following can be elements of set B ?

a. {3, 6, 9, 10}
b. { 6, 9, 12, 24 }
c. { 10, 20 }
d. {12, 24, 36 }

6. Which of the following statements is not true?

a. $If\ A = \{ factors\ of\ 12 \}, then\ n(A) = 6$
b. $\{ 2, 4, 9 \} = \{ 9, 2, 4 \}$
c. $\{ prime\ numbers\ which\ are\ divisible\ by\ 2 \} \neq \emptyset$
d. $0 \in \emptyset$

For items 7 – 8, refer to the given sets below.

Given a universal set $U, where\ U = \{\ x\ is\ an\ integer\ , where\ 17 \leq x < 29\}$

$A = \{\ x\ is\ a\ number\ such\ that\ the\ sum\ of\ its\ digit\ is\ an\ odd\ number\ \}$

7. How many elements are there is set A ?

a. 6 b. 5 c. 7 d. 4

8. What are the elements of set A' ?

a. {18, 20, 22, 24, 26} b. { 17, 19, 20, 22, 24 }

c. {17, 19, 21, 23, 25, 27} d. {17, 19, 20, 22, 24, 26, 28}

For items 9 – 10, refer to the given below

Given: A = { a, {a, b} , {c} }

9. Which of the following statement is not true?

a. $\{\ \} \subset A$ b. $\{\{a, b\}\} \subset P(A)$ c. $a \in A$ d. $\{a, b\} \in A$

10. How many proper subsets does set A have?

a. 8 b. 6 c. 7 d. 15

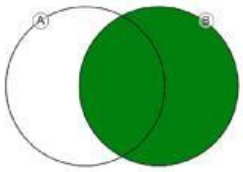
For items 11 – 12, refer to the statement below

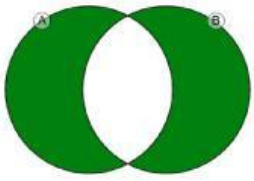
If $A \cup B = B$ and $A \cap B = A$, then _____.

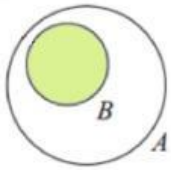
11. Which of the following statement is correct?

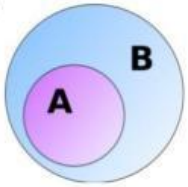
a. $A = B$ b. $A \subset B$ c. $B \subseteq A$ d. $B - A = \emptyset$

12. Which of the following Venn diagrams best represents the given statement?

a. 

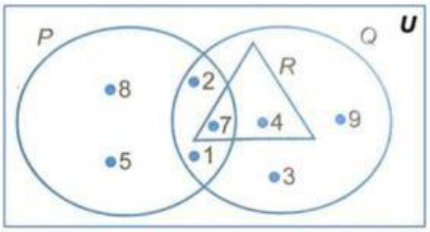
b. 

c. 

d. 

For items 13 – 15, refer to the Venn diagram below.

The Venn diagram on the right shows the sets P, Q and R



13. What are the elements of set $(P \cup Q) - R$?

a. {1, 2, 3, 4, 5, 7, 8, 9}
b. { 1, 2, 3, (}
c. {1, 2, 3, 5, 8, 9}
d. {3, 5, 8, 9 }

14. What are the elements of set $(P \cup Q \cup R)'$?

a. {1, 2, 3, 4, 5, 7,8, 9}
b. { }
c. {1, 2, 7 }
d. {7}

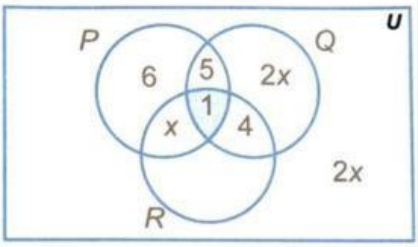
15. What are the elements of $(P \cap Q \cap R)'$?

a. {1, 2, 3, 4, 5, 8, 9}
b. {7}
c. {1, 2}
d. {1, 2, 7}

For items 16 – 18, refer to the Venn Diagram below

The Venn diagram below illustrates the number of elements in each set.

Suppose $n(Q) = n(P \cup R)'$



16. What are the number of elements in set $(P \cap Q) \cup (P \cap R) \cup (R \cap Q)$?

a. 14
b. 15
c. 10
d. 12

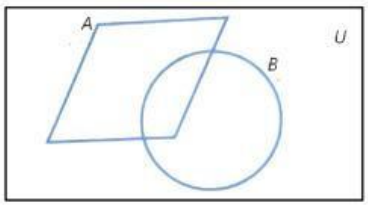
17. What are the number of elements in the Universal set U ?

a. 29
b. 32
c. 41
d. 45

18. What are the number of elements in set $(P \cup R) - Q$?

a. 6
b. 21
c. 12
d. 11

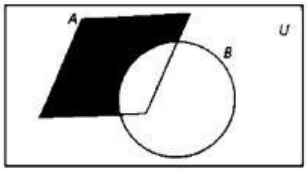
For items 19 – 20, refer to the Venn diagram below.



19. Which of the following is equivalent to $(A \cap B)'$?

a. $A' \cap B$
b. $A' \cup B'$
c. $A \cup B'$
d. $A \cap B'$

20. Which of the following sets is represented by the shaded region on the right?



a. $A \cup B'$
b. $A - B'$
c. $A \cap B'$
d. both a and b

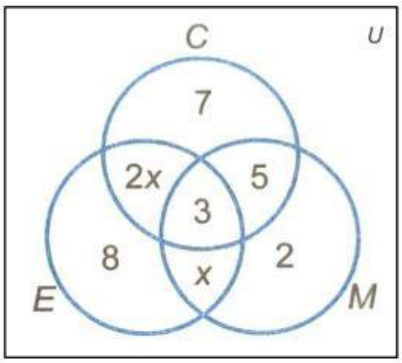
For items 21 – 23, refer to the Venn Diagram on the right.

The Venn diagram on the right shows the number of students In set C, set E and set M.

C = { students who can speak Chinese }

E = {students who can speak English }

M = { students who can speak Malay }



21. If the number of students who can speak Chinese and English is 9, how many students can speak only 2 languages?

a. 14 b. 17 c. 16 d. 19

22. How many students can speak English and Malay but not Chinese?

a. 3 b. 5 c. 6 d. 12

23. How many students are represented in the given Venn diagram?

a. 29 b. 30 c. 34 d. 40

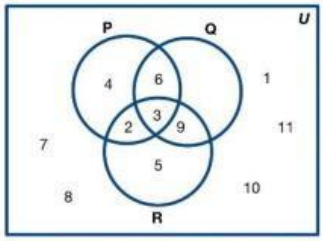
For items 24 – 26, refer to the given below

Given : Let U be the universal set , where

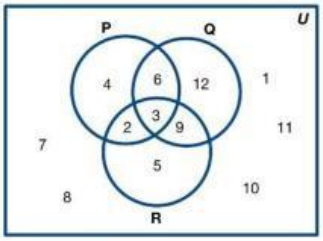
$$U = \{x | 1 < x \leq 12\} \text{ , and } x \text{ is an integer } \}$$
$$P = \{2, 4, 6, 9\}$$
$$Q = \{ \text{ multiples of } 3 \}$$
$$R = \{2, 3, 5, 9\}$$

24. Which of the following represents the set in the Venn diagram?

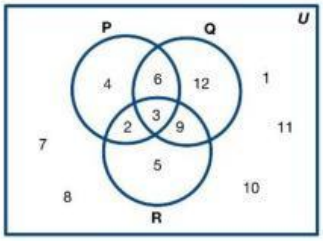
a.



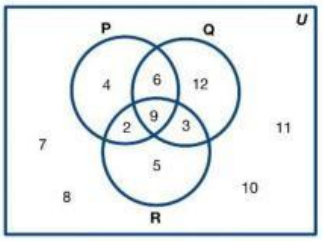
b.



c.



d.



25. What are the elements of set $(P \cap Q \cap R)'$?

a. {2, 3, 4, 5, 6, 7, 8, 10,11,12 }

b. {2, 3, 4, 5, 6, 7, 8, 10,11 }

c. {7, 8, 10, 11 }

d. {9}

26. How many elements are in the set $(A \cup B \cup C)'$?

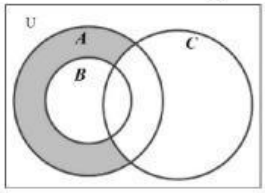
a. 3

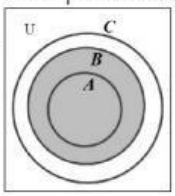
b. 4

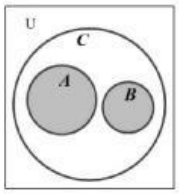
c. 5

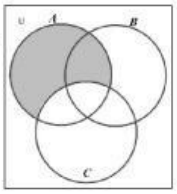
d. none

27. Look at the Venn diagrams below, which of the following best represents $(A \cup B) \cap C$?

a. 

b. 

c. 

d. 

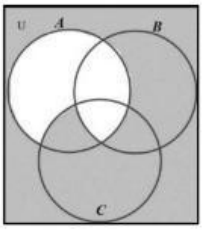
28. Which of the following set operations is best represented by the Venn diagram below?

a. $C \cap A' \cap B'$

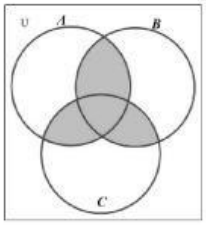
b. $A' \cup (B' \cap C)$

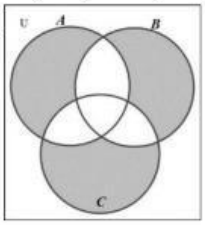
c. $(A - B) \cup C'$

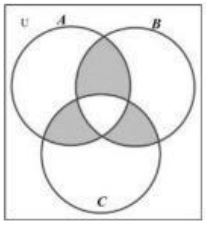
d. $(A \cap C') \cap B'$

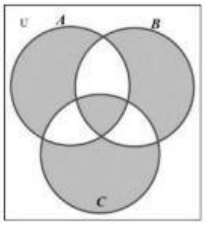


29. Which of the following Venn diagrams best represents $(A \cap B) \cup (A \cap C) \cup (B \cap C) - (A \cap B \cap C)$?

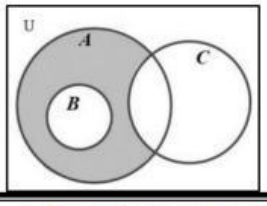
a. 

b. 

c. 

d. 

30. Which of the following best represents the diagram below?



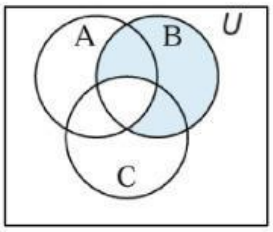
a. $(A - B) - C$

b. $(A \cap B) - C$

c. $A \cap C'$

d. $B \cup (A \cap C)$

31. Which of the following best represents the Venn diagram below?



a. $B - (A \cup C)$

b. $A' \cap (B \cup C)$

c. $(A \cup C)' \cap B$

d. $B - (A \cap C)$

For items 32 – 33, refer to the given below

Given: $A = \{x | x \in \mathbb{R}, and\ x^2 - 2x - 3 = 0\}$

$B = \{x | x \in \mathbb{Z}\ and\ 3 \leq x \leq 6\}$

32. How many proper subsets are there in set A ?

a. 3 b. 4 c. 7 d. 8

33. How many proper subsets does the set $B - A$ have?

a. 7 b. 8 c. 15 d. 16

For items 34 – 35, refer to the given below

Let $n(U) = 50$, $n(A) = 19$, $n(B) = 23$ and $n(A \cup B)' = 12$

34. What is the value of $n(A \cap B)'$?

a. 43 b. 45 c. 44 d. 46

35. What is the value of $n(B - A)$?

a. 21 b. 19 c. 20 d. 22

For items 36 – 38, refer to the given below

Let $n(U) = 70, n(A) = 40, n(B) = 35, n(C) = 26, n(A \cap B) = 13, n(A \cap C) = 17, n(B \cap C) = 20$ $and\ n(A \cap B \cap C) = 11$

36. What is the value of $n((A' \cup B')' \cap C')$?

a. 8 b. 6 c. 4 d. 2

37. What us the value of $n(A' \cup C')$?

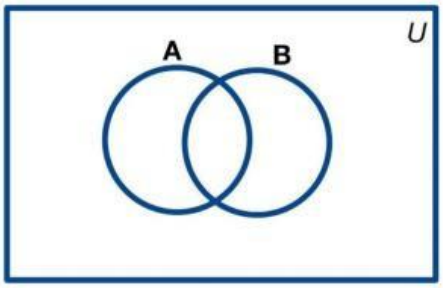
a. 63 b. 33 c. 53 d. 43

38. What is the value of $n(A' \cap B \cap C')$?

a. 11 b. 12 c. 13 d. 14

For items 39 – 40, refer to the given below.

In a survey of 45 people regarding their preference for two energy drink brands, 25 people liked Brand A, 30 liked Brand B, and 35 people liked at least one of the two brands.



39. How many people do not like either of the two brands?

a. 10 b. 15 c. 5 d. 30

40. How many people like both brands?

a. 10 b. 20 c. 30 d. 40