MTHS100 - Assignment 1

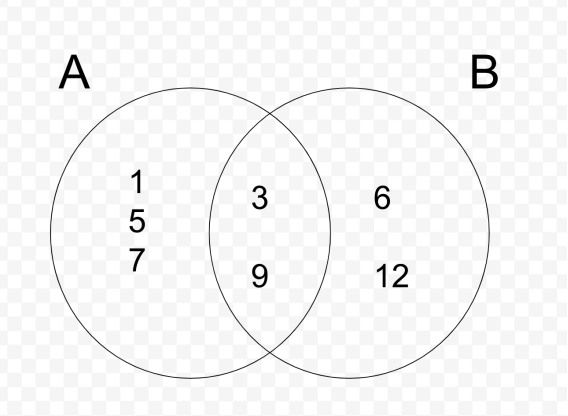
Question 1

The intersection of sets A and B is where common elements from both set A and set B exist.

The union of sets A and B is where elements exist in either A and or B.

Question 2

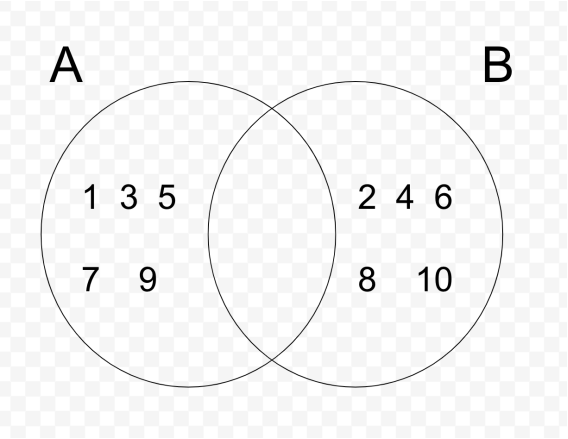
A)



$A \cap B = \{3, 9\}$

$A \cup B = \{1,3,5,6,7,9,12\}$

B)



$A \cap B = \varnothing$

$A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

Question 3

A) False. If the lines are parallel to one another, then there would be no intersection ever, making the intersection the empty set.

B) True. Because if set A was a subset of set B then all elements in A are in B making A an empty set and a subset to B.

C) True. There is no difference between A∩B=B∩A. If A=1, 2 and B=2, 3, then it doesn't matter if you put B as the first set or A as the first set, as there ∩ remains the same.

D) True. If B is a subset of C and A is a subset of B then A is also a subset of C.

E) False. This is because ∅ is a set containing no elements, but ∅ = {∅} is a set containing an empty set making the statement false as it has one element, even though that element is an empty set. ∅ = {} and {{}} = {∅}.

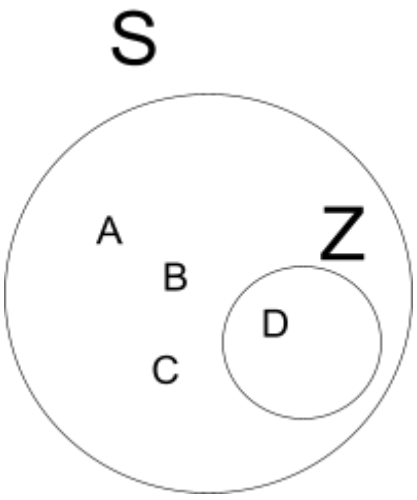
F) False. Just because B has only 2 elements, does not mean the interception of A and B will have 2 elements. Both elements could be exclusive to B with A containing neither or perhaps 1 element is shared making the interception equal 1.

Question 4

A \ B = {-2, 0, 2}

A \ B = {1, 2, 3, 4, 5, 6}

Question 5



(a) S \ Z

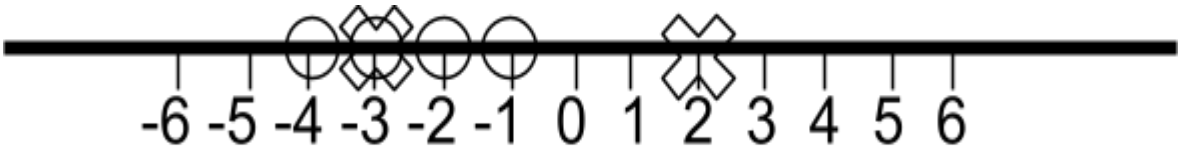
(b) S \ Z

(c) S \ Z

(d) Z

(e) S \ Z is the set of all students in a class that did not attend all 20 zoom meetings.

Question 6



$A \cap B = \{-3\}$

$A \cup B = \{-4, -3, -2, -1, 2\}$

$A \setminus B = \{-4, -2, -1\}$

$B \setminus A = \{2\}$

Question 7

a) $-2 < n < -1 = 0$. There are no integers that fall between -2 and -1 which is what this statement is asking.

b) $-2 \leq n < -1 = 1$. (-2) Only -2 is less than or equal to n and n cannot be above -1.

c) $-2 \leq n \leq -1 = 2$, (-2, -1) Either -2 or -1 by simply being equal to the integers in the statement.

Question 8

70 = 7 x 10
10 = 2 x 5
70 = 2, 5, 7

45 = 5 x 9
9 = 3 x 3
45 = 3, 3, 5

Question 9

Well taking from our work above, all we have to do is complete the sum of all the primes:

2 x 3 x 3 x 5 x 7 =

2 x 9 x 5 x 7 =

18 x 5 x 7 =

90 x 7 = 630

The LCM for 70 and 45 is 630.