BECA / Dr. Huson / Mathematics Name:
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Sets

1.

Which set builder notation represents $\{-2, -1, 0, 1, 2, 3\}$?

(1) $\{x|-3 \leq x \leq 3$, where x is an integer$\}$

(2) $\{x|-3 < x \leq 4$, where x is an integer$\}$

(3) $\{x|-2 < x < 3$, where x is an integer$\}$

(4) $\{x|-2 \leq x < 4$, where x is an integer$\}$

2.

Given:

$A = \{2, 4, 5, 7, 8\}$

$B = \{3, 5, 8, 9\}$

What is $A \cup B$?

(1) $\{5\}$

(2) $\{5, 8\}$

(3) $\{2, 3, 4, 7, 9\}$

(4) $\{2, 3, 4, 5, 7, 8, 9\}$

3.

If the universal set is {pennies, nickels, dimes, quarters}, what is the complement of the set {nickels}?

(1) { }

(2) {pennies, quarters}

(3) {pennies, dimes, quarters}

(4) {pennies, nickels, dimes, quarters}

4.

Which notation describes $\{1, 2, 3\}$?

(1) $\{x|1 \leq x < 3$, where x is an integer$\}$

(2) $\{x|0 < x \leq 3$, where x is an integer$\}$

(3) $\{x|1 < x < 3$, where x is an integer$\}$

(4) $\{x|0 \leq x \leq 3$, where x is an integer$\}$

5.

Given:

$U = \{1, 2, 3, 4, 5, 6, 7, 8\}$
$B = \{2, 3, 5, 6\}$

Set B is a subset of set U. What is the complement of set B?

(1) { }

(2) $\{2, 3, 5, 6\}$

(3) $\{1, 4, 7, 8\}$

(4) $\{1, 2, 3, 4, 5, 6, 7, 8\}$

6.

Given: $A = \{3, 6, 9, 12, 15\}$
$B = \{2, 4, 6, 8, 10, 12\}$

What is the union of sets A and B?

(1) $\{6\}$
(2) $\{6, 12\}$
(3) $\{2, 3, 4, 8, 9, 10, 15\}$
(4) $\{2, 3, 4, 6, 8, 9, 10, 12, 15\}$

7.

Given:

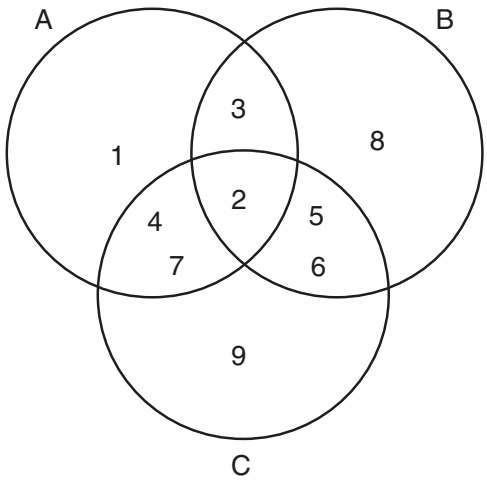
$X = \{1, 2, 3, 4\}$
$Y = \{2, 3, 4, 5\}$
$Z = \{3, 4, 5, 6\}$

What is the intersection of sets X, Y, and Z?

(1) $\{3, 4\}$
(2) $\{2, 3, 4\}$
(3) $\{3, 4, 5\}$
(4) $\{1, 2, 3, 4, 5, 6\}$

8.

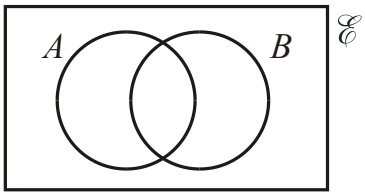
Which set represents the intersection of sets A, B, and C shown in the diagram below?



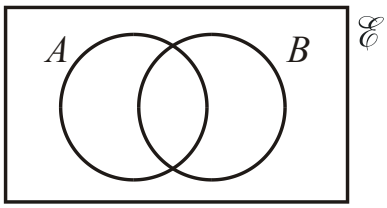
(1) $\{3, 4, 5, 6, 7\}$
(2) $\{2\}$
(3) $\{2, 3, 4, 5, 6, 7\}$
(4) $\{1, 2, 3, 4, 5, 6, 7, 8, 9\}$

9. In each of the Venn diagrams, shade the region indicated.

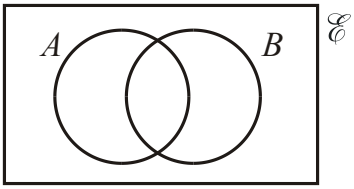
(a) $A \cap B$



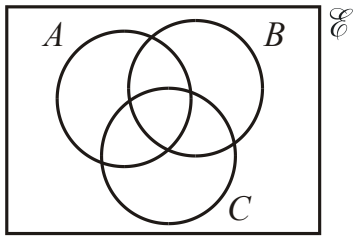
(b) The complement of $(A \cap B)$



(c) The complement of $(A \cup B)$



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



(Total 4 marks)

10. A group of 30 children are surveyed to find out which of the three sports cricket (C), basketball (B) or volleyball (V) they play. The results are as follows:

3 children do not play any of these sports
2 children play all three sports
6 play volleyball and basketball
3 play cricket and basketball
6 play cricket and volleyball
16 play basketball
12 play volleyball.

(a) Draw a Venn diagram to illustrate the relationship between the three sports played.

(1)

(b) On your Venn diagram indicate the number of children that belong to each region.

(3)

(c) How many children play only cricket?

(2)

(Total 6 marks)

11. The universal set U is defined as the set of positive integers less than 10. The subsets A and B are defined as:

A = {integers that are multiples of 3}
B = {integers that are factors of 30}

(a) List the elements of

(i) A;

(ii) B.

(b) Place the elements of A and B in the appropriate region in the Venn diagram below.