Answer on Question #44533 – Math - Algebra

Task:

Consider the sets A = {3x|x∈ Z}, B = $\{x \in Q | -5 \leq x \leq 10\}$, C = {factors of 20 in Z}.

Represent $A \cap B$, $BC \cup C$ and $C \backslash A$ by the listing method and in a single Venn diagram.

Solution:

$A \cap B$:

$A = \{0, 3, -3, 6, -6, 9, -9, 12, -12 \dots\}$;

$B = \{x \in Q | -5 \leq x \leq 10\} = \{-5, \dots, -3, \dots, 0, \dots, 1, \dots, 3, \dots, 6, \dots, 9, \dots, 10\}$;So, $A \cap B = \{-3, 0, 3, 6, 9\}$;

$BC \cup C$:

$B = \{x \in Q | -5 \leq x \leq 10\}$; $C = \{1, -1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\}$;

$BC = \{-5, -4, -2, -1, 1, 2, 4, 5, 10\}$; So $BC \cup C = \{-1, 1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\},$;

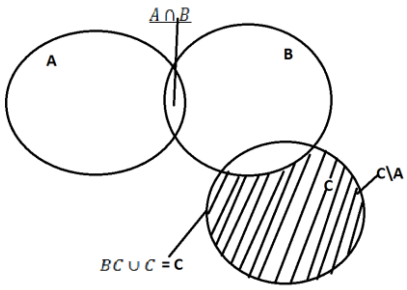
C\A:

$C = \{1, -1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\}$;

$A = \{0, 3, -3, 6, -6, 9, -9, 12, -12, 15, -15, 18, -18, 21, -21, \dots\}$;

$C \backslash A = \{1, -1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\}$;

Venn diagram:



Answer:

So, $A \cap B = \{-3, 0, 3, 6, 9\}$

$BC \cup C = \{-1, 1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\}$

$C \backslash A = \{1, -1, 2, -2, 4, -4, 5, -5, 10, -10, 20, -20\}$