2. Given A, B, C ⊆ S where

S = {x ∈ N | x ≤ 20}

A = {x ∈ S | (∃y ∈ Z)(∃z ∈ Z)(20y + xz = 1)

B = {x ∈ S | (∃y ∈ Z)(x = 2y + 1)

C = {x ∈ S | (∃y ∈ N)(x = 5y)

Find

a) (A ∩ B’ ∩ C)’

S = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}

A = {1, 3, 7, 9, 11, 13, 17, 19}

B’ = {2, 4, 6, 8, 10, 12, 14, 16, 18, 20}

C = {5, 10, 15, 20}

ANSWER:

A ∩ B’ = {Ø}

A ∩ B’ ∩ C = {Ø}

(A ∩ B’ ∩ C)’ = S

b) C ∪ (A’ − (S − B))

S = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20}

A’ = {2, 4, 5, 6, 8, 10, 12, 14, 15, 16, 18, 20}

B = {1, 3, 5, 7, 9, 11, 13, 15, 17, 19}

C = {5, 10, 15, 20}

ANSWER:

S – B = B’

A’ – B’ = {5, 15}

C ∪ (A’ – B’) = C

C = {5, 10, 15, 20}