CS 225 Quiz Over Week 3 Materials
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1)

A = { a $\in$ Z | 18a – 2 } = 18(b + 1) - 2

= 18(n – 1) + 18 – 2

= 18(n – 1) + 16

B = { b $\in$ Z | 18b + 16 }

= 18(b - 1) + 18 - 2

= 18 (b - 1) + 16

Therefore A $\subseteq$ B

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2) False

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3)
P(A)

A = {8, 9} * 2

P(A) = {ϕ, {8}, {9}, {8, 9}, {16}, {18}, {16, 18}

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4)

A X (B X C)

A = {-1, 0, 1, 2, 3} * 3 (evaluate n first then use that in the cartesian)

B = {1, 2}

C = {{1,2}} - single set in a set

{(-3, (1, {1, 2})), (-3, (2, {1, 2})),

(0, (1, {1, 2})), (0, (2, {1, 2})),

(3, (1, {1, 2})), (3, (2, {1,2})),

(6, (1, {1, 2})), (6, (2, {1, 2})),

(9, (1, {1, 2})), (9, (2, {1, 2})) }

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5)

$A^c \cap B^c \subseteq (A \cup B)^c$

Let $X \in A^c \cap B^c$

$X \in A^c \cap B^c$

$= X \in A^c \cap X \in B^c$

$= X \notin A \cap X \notin B$

$= X \notin (A \cup B)$

$= X \in (A \cup B)^c$

Therefore: $A^c \cap B^c \subseteq (A \cup B)^c$

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6)

(A – (A ∩ B)) ∩ (B – (A ∩ B))

= (A ∩ (~A ∪ ~B)) ∩ (B ∩ (~A ∪ ~B)) *Complementary*

= [(A ∩ ~A) ∪ (A ∩ ~B)] ∩ [(B ∩ ~A) ∪ (B ∩ ~B)] *Distributive*

= [∅ ∪ (A ∩ ~B)] ∩ [(B ∩ ~A) ∪ ∅]

= (A ∩ ~B) ∩ (B ∩ ~A)

= A ∩ (~B ∩ B) ∩ ~A *Associative*

= A ∩ ∅ ∩ ~A

= ∅ ∩ ~A

= ∅

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7)
a)

a2 = 3 * 2 - 5 = 1

a3 = 3 * 3 - 5 = 4

a4 = 3 * 4 - 5 = 7

a5 = 3 * 5 - 5 = 10

1 + 4 + 7 + 10 = 22

b)

a0 = 2^0 + 2 = 4

a1 = 2^1 + 2 = 8

a2 = 2^2 + 2 = 16

a3 = 2^3 + 2 = 32

a4 = 2^4 + 2 = 64

4 + 8 + 16 + 32 + 64 = 124

c)

a3 = 3(-2)^3 = -24

a4 = 3(-2)^4 = 48

a5 = 3(-2)^5 = -96

a6 = 3(-2)^6 = 192

a7 = 3(-2)^7 = -384

-24 + 48 - 96 + 192 - 384 = -264