#) Introduction to Computer So	cience: (Sheet # 03)
Initiation to Compluter Sc	Terline (Spect 11)
Train y	KINGTON A G T
Problem 3.1:	
- (1)	tika de počítko ne v
An (BUC) = (An	B) U (AAC)
let x E An (Buc),	AxA Today and The
This means that	
$= X \in A \text{ and } A$	(€ (BUC)
$= \times \in A$ and $()$) or (x f A and x f C)
$= X \in A \text{and} (X \in B)$ $= (X \in A \text{and} X \in B)$ Hence, $= X \in (A \cap B) U$	$x \in (A \cap C)$
Title, - A C (Harb)	= 24 E A A 24 E B
Thus, X E (A OB)	U (A O C)
2c (8x8) u	= 7€ (D×4) X
Since we let $x \in A \cap$	(Ruc)
we can prove that	more without we have a fill few to it.
00(0,10)	ANB) U (ANC) D
A = A + A + A + A + A + A + A + A + A +	en, upcan snawthat the distribu
law for sets has been proven	on, we can structure the sustained
law - M sas has been process	

Problem 3.2: a) $(x, y) \in ((A \cap B) \times (C \cap D) = (A \times C) \cap (B \times D)$ $\Lambda = and$ can be written as: x (AnB) x (cnp)y for cartesian product A x B: AXB = { (a,b) | a EA N b EB} So, $\alpha \in (A \cap B) \times y \in (c \cap D)$ = $\alpha \in (A \cap B) \wedge y \in (c \cap D)$ MEAN MEBNYECNYED $\mathcal{X}(A \times C)$ \mathcal{Y} $\mathcal{X}(B \times D)$ \mathcal{Y} $\mathcal{X}(A \times C)$ \mathcal{Y} $\mathcal{X}(B \times D)$ \mathcal{Y} $\mathcal{Y}(A \times C)$ $\mathcal{Y}(B \times D)$ $\mathcal{Y}(B \times D)$ $\mathcal{Y}(B \times D)$ $\mathcal{Y}(B \times D)$ Thus, $(A \cap B) \times (C \cap D) \subseteq (A \times C) \cap (B \times O)_{\square}$

b) $(AUB) \times (CUD) = (A \times C) \cup (B \times D)$ = n(AUB) x (CUD) y = $\chi \in (AUB) \land y \in (CUD)$ = $(\chi \in A \# \chi \in B) \land (y \in C \# y \in D)$ = $[x \in A \land y \in C]$ or $(x \in A \land y \in D)$ $V[x \in B \land y \in C]$ $V[x \in B \land y \in C]$ = $\left[\left(\left(A \times C \right) \right) \right] \vee \left(\left(\left(A \times D \right) \right) \right] \vee \left[\left(\left(B \times C \right) \right) \right] \vee \left(\left(\left(B \times C \right) \right) \right)$ (2,4) E (AXC) U (AXO) U (BXC) U (BXD) Looking at this, the statement given misses (BxC) U (AxD) So, up can say that it doesnot equal to the right hand side of the statement and hence disproves the proposition

Date Problem 3.3. R= { (a,b) | a,b ∈ Z ∧ |a-b| ≤ 3} let a=4, b=2 for proving these cases for reflexine: we need to prove $(a,a) \in R + x \in A$ So, la-al Jan Hay Mar Ada Call ANA A ≤ 3 and $0 \in \mathbb{Z}$ we can Say that His reflexive, for symmetric: we need to prove (aRb A bRa) + (a,b) & A So, la-bl (and |b-a|Since both are <3, we can prove that ther is symmetric, set Aran Hive as there / The following: "is no /c/ to prove and/ (al

Plate	
b) $R = \{(a,b) \mid a,b \in \mathbb{Z} \land (a,b) \mid a,b \in \mathbb{Z} \land$	nod 10) = (b mod 10) }
for reflexive:	4918 am
JEST DA DO CARDA GAR	Learning of Stages 201
By the proporties af the equality sign (a mod 10) = (a mod 10) As, (a, a) E R + 2 E A	we can prove that
$(a \mod 10) = (a \mod 10)$) shot
HS, (a, a) E K + 2 E H	we can shaw that
The relationship is reflexive,	D 802 VI, 001
0	La - tu
for symmetric:	F= 70 m
- B in C & B	8 % B-1 8 F
for this case too, by the properties a prove that if a mod 10 =	the equalify sign we can
prove that 17 a mod 10 =	b mad 10 then
b mod 10 = a mod 10.	I har out to
Hence, we can say that	
(a R b) N (b Ra)	₩ (a,b) E A
and that this relationship is	symmetric.
	Yakalist si
for transitive:	
If a set has (a mod 10)=(1	mad 10) and
(h mod 10) = (c mod 10)	
up can prope that hithe	equality sign 's
according (a mad 10)	Signes S
If a set has (a mod 10) = (b) (b) mod 10) = (c) mod 10), we can prove that by the property (a mod 10) = (c)	maox 10)
Hence, (alb) n (bRc) n (aRc)	$ \# a,b,c \in A_{\Pi} $
So the relationalis is reflexive summetic	and transitive
So, the relationship is reflexive symmetric. This is can equivalence relation	n.

Problem 3.4:

a) by using : type zip on hashell we can delermine that the type signature of the zip function is

$zip :: [a] \rightarrow [b] \rightarrow [(a,b)]$

This shows that only two type variables appear in the type signature of zip. It cannot be more or less as the friction only allows for two type variables. We cannot change its type to acommodate more or less types as that Modifies the behavior of the friction.

- b) > 2 + 3 :: Num a => a

 This involves the sum of two integers so the type of the adopt
 is give an Integer.
 - → 2+9 'div' 3:: Integral a ⇒ a

 This expression involves an integer division and is then added to 2 which is Int. Hence, resulting in the integral type class where the elements are two types:

 Int and Integer.
 - → 2+9/3:: Fractional a => a

 This expression uses fractional division and results in a fractional number being added to 2. So, because of the division operator this is fractional type class that involves gerations like fractions.

Source
> 2 + sqrt 9 :: Floating a => a Ove to the sqrt operator the expression of type floating as a floating point number is the adjust that is added to 2' and still remains floating.
facile [d] e [d] e gis
This your that only there were the depose in the ever strengther at the time to contain the most on the asked which is not on the action there is the contract of the contract
D + 2 + 2 :: Non a + a. The industry sampling integer with the afficient with the analysis with the sample with the sample of t
Tring a description involves the integer division and is then added to 2 which is Tab, then to division in the integer division in the integer of the density of the forest
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- 2 + 1 / 5 = Fredieral a ++ a. This segments use the division and reality to a deline Training for a did da 2 to a consecutive and a reality to a deline.
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