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Math 8 HW 11
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3. If KEZ, then frez: n/kg sin ez: n/k23

Let $x \in \{n \in \mathbb{Z} : n \mid k\}$. In this case, we know that $x \mid k$. Because of this, there exists an integer y such that k = xy. Because of this, $k^2 = x^2y^2$, which is equivalent to $k^2 = x(xy^2)$, which demonstrates that $x \mid k^2$. As a result, $x \mid k^2$ implies $x \in \{n \in \mathbb{Z} : n \mid k^2\}$. Thus, $\{n \in \mathbb{Z} : n \mid k\} \subseteq \{n \in \mathbb{Z} : n \mid k^2\}$. Thus,

8. If A,B,C are sets, then A U (Bnc) = (AUB) n (AUC)

- dec of intersec. A U (Bnc) = {x: (xeA) U ((xeB) n (xeC))}

- distrib property = {x: (xeA U xeB) n (xeA U xeC)}

- dec of union = {x: (xeA U xeB) n (xeA U xeC)}

- def of intersection => (AUB) n (AUC)

Hence, if A,8,6 are sets, then AU (Bnc) = (AUB) n (AUC)

9. If A,B,C are sets, then A \cap (BUC) = (A \cap B) \cup (A \cap C)

-def of intersec (A \cap (BUC) = $\{x: (x \in A) \cap (x \in B \cup C)\}$ -def of union

= $\{x: (x \in A) \cap (x \in B) \cup (x \in C)\}$ -def of inters

= $\{x: (x \in A) \cap (x \in B)\} \cup ((x \in A) \cap (x \in C))\}$ -def of union

= $\{x: (x \in (A \cap B)) \cup (x \in (A \cap C))\}$ -def of union

= $\{x: (x \in (A \cap B)) \cup (x \in (A \cap C))\}$ -def of union

-def of

14	
10.	If A & B are sets in a universal set U, then AOB = AUB
	tet x e Ang.
	= × \(\xi \((A \cap B)\)
	= (x \(\frac{1}{2}\) \(\text{X}\) \(\text{B}\)
	$= (x \in \overline{A}) \cup (x \in B)$
14	⇒ x e(Ā u Ē)
	Thus, AOB = AUB
	Thorax altonomic and a second a water