

MATH 210 Discrete Mathematics – Session 6

Which arguments appear valid?

If the sum of the digits of this number is divisible by 9, then this number is divisible by 3.
 The sum of the digits of this number is divisible by 9.
 \therefore This number is divisible by 3.

$p \Rightarrow q$
 p
 $\therefore q$

.....
 If the sum of the digits of this number is divisible by 9, then this number is divisible by 3.
 This number is not divisible by 3.
 \therefore The sum of the digits of this number is not divisible by 9.

$p \Rightarrow q$
 $\sim q$
 $\therefore \sim p$

.....
 If the sum of the digits of this number is divisible by 9, then this number is divisible by 3.
 This number is divisible by 3.
 \therefore The sum of the digits of this number is divisible by 9.

$p \Rightarrow q$
 q
 $\therefore p$

.....
 Give a reason for each step.

- (1) $ab = 0$ and $b \neq 0$ premise
- (2) $ab = 0$ _____
- (3) If $ab = 0$ then $a = 0$ or $b = 0$. _____
- (4) $a = 0$ or $b = 0$ _____
- (5) $b \neq 0$ _____
- (6) $a = 0$ _____
- (7) \therefore If $ab = 0$ and $b \neq 0$ then $a = 0$.