حل اسئلة الامتحان

Q.1/ Show that the mathematical system $(G, *)$ is group

$\ni G = Z$ and $* : a*b = 2a+2b-5 \quad \forall a,b \in Z$

solution : ① closure

$\forall a,b \in Z \Rightarrow a*b = 2a+2b-5$

$\therefore$ closure is satisfy

② Associative

let $a,b,c \in Z$, t.p. $(a*b)*c \overset{?}{=} a*(b*c)$

L.H. $(a*b)*c =$

$(2a+2b-5)*c = 2(2a+2b-5)+2c-5$

$= 4a+4b+2c-15 \quad \text{---} ①$

R.H. $a*(b*c) = a*(2b+2c-5)$

$= 2a+2(2b+2c-5)-5$

$= 2a+4b+4c-15 \quad \text{---} ②$

$\because ① \neq ②$

$\therefore$ Associative is not satisfy

$\therefore (G,*)$ is not group