

so $(a * b) * c = a * (b * c) (\forall) a, b, c \in S$

f). $S = \mathbb{R}$ $a * b = b$

$\therefore a * b = b \in S (\forall) a, b \in S$ it is a binary operation

• not commutative

counterex. $a = 1$ $1 * 2 = 2$

$b = 2$ $2 * 1 = 1$

so $1 * 2 \neq 2 * 1$

• associative:

$(a * b) * c = b * c = c$

$a * (b * c) = a * c = c$

so $(a * b) * c = a * (b * c) (\forall) a, b, c \in S$

g). $S = \{1, -2, 3, 2, -4\}$ $a * b = |b|$

not a binary operation

counterex. $a = 1$ $1 * (-4) = |-4| = 4 \notin S$

$b = -4$

h). $S = \{1, 6, 3, 2, 18\}$ $a * b = ab$

not a binary operation

counterex. $a = 2$ $2 * 18 = 36 \notin S$

$b = 18$