Name _____

Math 541 – Quiz II September 22, 2000

An **associative monoid** is a set G equipped with an operation

$$G \times G \to G : (a, b) \mapsto a * b$$

such that

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

for all $a, b, c \in G$. An element $e \in G$ is called an **identity element** iff

$$a * e = e * a = a$$

for all $a \in G$. Is an identity element (if it exists) unique? If yes, prove it. If no, give an example of an associative monoid with two distinct identity elements.