

Math 476

Homework 1

Due: 4:00pm on Thursday, August 30th

Let $S = \mathbb{R}$ and consider the following binary operations:

1. $x \& y = 2xy$

2. $x \$ y = \frac{x + y}{2}$

3. $x \# y = x + 2y$

For each operation defined above, determine, with proof, each of the following:

(a) Is the operation commutative?

(b) Is the operation associative?

(c) Is there an element that acts as an identity element?

(d) Which elements (if any) have inverses? If any do, show the form of the inverse by giving a general “formula”.

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