Math 302A, Section 001 Instructor: Prasad, Spring 2012

Properties of the Four Operations

| Property | My Way of Remembering | Addition | Multiplication |
|---|---|---|---|
| Associative property<br>Associativity | | | $(a\times b)\times c=a\times(b\times c)$<br>$(ab)c=a(bc)$ |
| Commutative property<br>Commutativity | | $a+b=b+a$ | |
| Distributive property | | $a\times(b+c)=a\times b+a\times c$<br>$a(b+c)=ab+ac$<br><br>$(b+c)\times a=b\times a+c\times a$<br>$(b+c)a=ba+ca$ | |
| Identity element | | | $a\times 1=a$<br>$a\,1=a$<br>$1\,a=a$ |

Extension Questions

1. Show that the two versions of the distributive property that are shown are identical. What other property did you use to show this?
2. Which property do the standard and partial products algorithms for multiplying rely on the most?
3. Are subtraction and/or division commutative? Associative? Give examples to justify your answer.
4. How would you use the distributive property for the following expression: *a(b – c)* ?

In Groups

Come up with representations to justify the first three properties. You can use any manipulatives/pictures that you think are helpful.