a. based on elementary math, we know that

$$A \times B = B \times A$$

The only chance which makes the result change in this machine is the rounding step.

However, the same number will be rounded by same rules.

So, for this machine ab always equals ba.

b. On the other hand, $a(bc)$ does not always equal to $(ab)c$ because. we have 2 steps of multiplication, which means we need to store the results of the first step.

Thus, if we do bc first and its result does not need to be rounded but the result of ab needs to be. $a(bc)$ will not equal $(ab)c$.

Here is the example.

$a=2$ $b=72$ $c=658$

step 1	$2\times72=144$	$b\times c = 72\times658=47376$
round results	1.44×10^2	4.738×10^5

step 2	$144 \times 658 = 94752$	$47380 \times 2 = 94760$
rowed result	9.475×10^4	9.476×10^4

The difference comes from we only need to do the round once on the left. but twice on the right.

C. because we have 4 mantissa digits, which represents $x.xxx$, so the machine epsilon should be 0.0005. this is the min value which makes round happen