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associativity of multiplication

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It's important to know the following interpretation of the associative law

$$a \cdot (b \cdot c) = (a \cdot b) \cdot c \quad (1)$$

of multiplication in arithmetics and elementary algebra:

A product $(b \cdot c)$ is multiplied by a number (a) so that only one (b) of the product is multiplied by that number.

This rule is sometimes violated even in high school e.g. like

$$10 \cdot 2.5 \cdot 0.3 = 25 \cdot 3 = 75,$$

which is wrong. Or when solving an equation like

$$x \cdot \frac{2x - 1}{3} = 1$$

one would like to multiply both sides by 3 for removing the denominator, getting perhaps

$$3x(2x - 1) = 3;$$

then the both of left side have incorrectly been multiplied by 3.

The reason of such mistakes is very likely that one confuses the associative law with the distributive law; cf. (1) with this latter

$$a \cdot (b + c) = a \cdot b + a \cdot c, \quad (2)$$

which two different operations, multiplication and addition; both *addends must be multiplied separately*.