The mixed fractions conundrum

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CONTINENTAL EUROPE:

$$3\frac{1}{4} \ ?$$

omission of operator between two quantities is always: $\times$

$$3x = 3 \times x$$

$$3\frac{1}{4} = 3 \times \frac{1}{4} = \frac{3}{4}$$

$$x\frac{1}{2} = \frac{1}{2}x = \frac{x}{2} \text{ (commutative property of } \times \text{)}$$

ENGLISH, U.S., AND THE *mixed fractions* SYSTEM:

$$3\frac{1}{4} \ ?$$

omission of operator between two quantities is not always:$\times$

$$3x = 3 \times x$$

$$3\frac{1}{4} = 3 + \frac{1}{4} = \frac{13}{4}$$

$$\text{confusion for } \times \ : x + \frac{1}{2} = x\frac{1}{2} \neq \frac{1}{2}x = \frac{1}{2} \times x$$

$$\text{confusion for } + \ : x + \frac{1}{2} = x\frac{1}{2} \neq \frac{1}{2}x \neq \frac{1}{2} + x$$

Neither the commutative property of $\times$ or that of $+$ are visible since the two notations mean different things and follow a different logic. Common sense dictates that this may be a source of confusions. Even though this system is meant to write fractions in a simple way - as though improper fractions were somehow more scary or less potent that proper fractions - a pupil taught that way may face problems in his future as this notation tends to

be quickly be abandonned along the way, forcing the brain to somehow rewire.

Anecdotal evidence:

A Franco-vietnamese friend (biostatistician born and educated in vietnam): "*I learned it when I was 9 and stopped using it when I was 14.*"

A French friend (public service, Bac Scientifique, Master d'Economie): "$3\frac{1}{4}$ *fait selon moi* $3 \times \frac{1}{4}$"