# numerator and denominator increased by same amount

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Let the positive fraction $\dfrac{a}{b}$ be altered by adding a positive number $\delta$ to both $a$ and $b$. Then

$$\frac{a}{b} < \frac{a+\delta}{b+\delta} \quad \text{if} \quad a < b,$$

$$\frac{a}{b} > \frac{a+\delta}{b+\delta} \quad \text{if} \quad a > b.$$

The asserted inequalities follow from the identity

$$\frac{a}{b} - \frac{a+\delta}{b+\delta} = \frac{(a-b)\delta}{b^2+b\delta}.$$

Accordingly, we have for example

$$\frac{2}{3} < \frac{3}{4}, \quad \frac{200}{99} > \frac{201}{100}.$$