Quiz 1. *True/False*: If you decrease 178 by 20% consecutively three times, the result is given by $178(1 - 3 \cdot 0.20) = 178(1 - 0.60) = 178(0.40) = 71.2$.

Solution. The statement is *false*. If we want to compute N increased or decreased by a %, we compute $N \cdot (1 \pm \%_d)$, where $\%_d$ is the percentage written as a decimal and we choose '$+$' if it is a percentage increase and choose '$-$' if it is a percentage decrease. Then to compute 178 decreased by 20% consecutively three times, we need take $N = 178$, $\%_d = 0.20$, and choose '$-$'. Therefore, we have...

$$N \cdot (1 \pm \%_d) = 178(1 - 0.20)^3 = 178(0.80)^3 = 178(0.512) = 91.136$$

From the $178(0.512)$ portion from the computation above, we can see that decreasing a number by 20% consecutively three times actually results in a 48.8% decrease in the original numbers value because $1 - 0.512 = 0.488$. The mistake made in the quiz is thinking that repeated percentage increases or decreases are additive. A decrease of 20% three times *does not* result in a $3 \cdot 20\% = 60\%$ decrease, which was the percentage decrease computed in the quiz statement.