

Solutions

2.1 A For a product or quotient, adding fractional uncertainties is a common maximum-uncertainty approximation. For a difference, add absolute uncertainties. A nonzero intercept can reveal an offset or an incomplete model.

2.2 percentage uncertainty = $1/40 \times 100 = 2.5\%$.

2.3 False. Repeating readings reduces random uncertainty in a mean but does not automatically remove a zero error. Do not quote more decimal places than your measurement can support.

2.4 uncertainty. uncertainty means A quantified limitation on a measured result.

3.1 Quotient 2.5. Maximum estimate $2\% + 5\% = 7\%$, absolute $0.175 \approx 0.18$. Independent standard uncertainties instead combine in quadrature, about 5.39% ; declare which convention the data support.