Write x_i for the non-missing elements of x, n for their number, μ for their mean, s for their standard deviation, and $m_r = \Sigma_i (x_i - \mu)^r / n$ for the sample moments of order r.

Joanes and Gill (1998) discuss three methods for estimating skewness:

Type 1: $g_1 = m_3 / m_2^{3/2}$ This is the typical definition used in many older textbooks.

Type 2: $G_1 = g_1 \sqrt{n(n-1)} / (n-2)$ Used in SAS and SPSS.

Type 3: $b_1 = m_3/s^3 = g_1((n-1)/n)^{3/2}$ Used in MINITAB and BMDP.

All three skewness measures are unbiased under normality.

D. N. Joanes and C. A. Gill (1998), Comparing measures of sample skewness and kurtosis. *The Statistician*, 47, 183–189.

Write x_i for the non-missing elements of x, n for their number, μ for their mean, s for their standard deviation, and $m_r = \Sigma_i (x_i - \mu)^r / n$ for the sample moments of order r.

Joanes and Gill (1998) discuss three methods for estimating kurtosis:

Type 1: $g_2 = m_4/m^2 - 3$. This is the typical definition used in many older textbooks.

Type 2: $G_2 = ((n+1)g_2 + 6) * (n-1)/((n-2)(n-3))$. Used in SAS and SPSS.

Type3: $b_2 = m_4/s^4 - 3 = (g_2 + 3)(1 - 1/n)^2 - 3$.UsedinMINITABandBMDP.

Only G_2 (corresponding to type = 2) is unbiased under normality.

D. N. Joanes and C. A. Gill (1998), Comparing measures of sample skewness and kurtosis. *The Statistician*, 47, 183–189.