Linear combinations of uncertain numbers

A first exercise

Imagine we have measured the two sides of an A4 paper, obtaining

$$\begin{aligned} a &= 29.73 \pm 0.03\,\text{cm} \\ b &= 21.45 \pm 0.04\,\text{cm}\,. \end{aligned}$$

1. Evaluate (expected values, standard uncertainty and correlation)
   - their difference ($d = a - b$);
   - their sum ($s = a + b$);

   assuming $\rho(a, b) = 0$ or $\rho(a, b) = +0.8$.
2. Evaluate the same quantities by Monte Carlo simulation.
3. Repeat points 1. and 2. changing $\sigma(a)$: 0.03. 0.04, 0.05 cm.