Example: Single Standard Additions

First set up the standard addition plot data

$x := (0 \quad 1)^T$ volume of added standard, in mL

$y := (2.11 \quad 6.37)^T$ uncorrected measurements, in arbitrary units

$V_a := 50.00$ volume of sample, in mL $C_{std} := 100$ concentration of standard, in ppm

In this case, we must correct the signal for the effects of dilution due to the addition of the standard.

$i := 0 .. 1$ $y_{corr_i} := y_i \cdot \frac{V_a + x_i}{V_a}$ $y_{corr}^T = [\, 2.1100 \quad 6.4974 \,]$

$b_0 := y_0$ $b_0 = 2.1100$ "intercept" is simply the first measurement

$\Delta x := x_1 - x_0$ $\Delta y := y_{corr_1} - y_{corr_0}$ $b_1 := \frac{\Delta y}{\Delta x}$ $b_1 = 4.3874$ slope of std addition plot

$Vprime := \frac{b_0}{b_1}$ $Vprime = 0.4809$ in mL

$C_a := C_{std} \cdot \frac{Vprime}{V_a}$ $C_a = 0.9618$ point estimate of concentration, in ppm

The concentration of copper in the brandy was measured at 0.912 ppm.