

- 5-1. Slope = $-1.29872 \times 10^4 (\pm 0.0013190 \times 10^4) = -1.299 (\pm 0.001) \times 10^4$
 Intercept = $256.695 (\pm 323.57) = 3 (\pm 3) \times 10^2$

5-8 (a) $x = \frac{y - b}{m} = \frac{2.58 - 1.35}{0.615} = 2.00$

$$s_x = \frac{s_y}{|m|} \sqrt{\frac{1}{k} + \frac{x^2 n}{D} + \frac{\sum (x_i^2)}{D} - \frac{2x \sum x_i}{D}}$$

$$= \frac{0.196}{0.615} \sqrt{\frac{1}{1} + (2.00)^2 \frac{4}{52} + \frac{62}{52} - \frac{2(2.00)14}{52}} = 0.38$$

(b) Replace the $1/k$ inside the square root by $\frac{1}{4} \Rightarrow \sigma_x = 0.26$

- 5-16. A small volume of standard will not change the sample matrix very much, so matrix effects remain nearly constant. If large, variable volumes of standard are used, the matrix is different in every mixture and the matrix effects will be different in every sample.

5-17. (a) $[\text{Cu}^{2+}]_f = [\text{Cu}^{2+}]_i \frac{V_i}{V_f} = 0.950 [\text{Cu}^{2+}]_i$

(b) $[\text{S}]_f = [\text{S}]_i \frac{V_i}{V_f} = (100.0 \text{ ppm}) \left(\frac{1.00 \text{ mL}}{100.0 \text{ mL}} \right) = 1.00 \text{ ppm}$

(c) $\frac{[\text{Cu}^{2+}]_i}{1.00 \text{ ppm} + 0.950[\text{Cu}^{2+}]_i} = \frac{0.262}{0.500} \Rightarrow [\text{Cu}^{2+}]_i = 1.04 \text{ ppm}$

- 5-19. (a) Data for the graph are shown in the spreadsheet. The negative intercept of the graph is 0.0698 M. The original concentration of analyte is twice as great because 25.00 mL was diluted to 50.00 mL in each flask. The original concentration of Na^+ is therefore 0.140 M.

	A	B	C	D
1	Standard addition: Mix 2.64 M Na^+ with 25.00 mL serum			
2				
3	V(total)(mL) =	$V_s = \text{NaCl}$	x-axis function	I(s+x) =
4	50	added (mL)	$S_i * V_s / V(\text{total})$	signal (mV)
5	$[S]_i$ (M) =	0.000	0.0000	3.13
6	2.64	1.000	0.0528	5.40
7	V(serum) (mL) =	2.000	0.1056	7.89
8	25	3.000	0.1584	10.30
9		4.000	0.2112	12.48
10				
11	C5 = \$A\$6*B5/\$A\$4			

