HW10 KEY

1. A $\widehat{\beta_1}$=46.578/514=0.0906, $\widehat{\beta_0}$=3365/33-0.0906*387/33=100.9072
   $\hat{y}$=100.9072+0.0906x
   This fitting equation does not make sense since the removal efficiency percentage cannot go beyond 100%. There is a mistake in the summary statistic I provided.

   B. The temperature 0 degree is outside the observed range of x, so we cannot really interpret the intercept here.

   C. When the inlet temperature increases by 1 degree, the removal efficient would increase by 0.0906 percent in average.

   D. x=12 is inside the observed range of x so we can make the prediction.
   100.9072+0.0906*12=101.9944 again make no sense because of the mistake I made. Sorry!

2. **Chapter 12, Section 12.5, Exercise 58 parts a b c**

a. Linear correlation

$$r \frac{14755500 - \frac{44615(3860)}{12}}{\sqrt{170355425 - \frac{44165^2}{12}}\sqrt{1284450 - \frac{3860^2}{12}}} = 0.9232 \quad \otimes$$

There is a strong positive correlation between TOST and RBOT. ⊗

b. The **correlation r remains the same** if x and y were switched. The formula is "symmetric" with respect to x and y. ⊗

c. Converting minutes to hours is a scalar-multiplication process (a linear transformation). So linear correlation **r will remain the same.** ⊗