1. The CI for the slope is $\hat{\beta}_1 \pm t(n-2, \alpha/2)\sqrt{\frac{MS[E]}{S_{xx}}}$ or more simply $\hat{\beta}_1 \pm t(n-2, \alpha/2)SE(\hat{\beta}_1)$.
   Let's pretend we don't know the standard error. We have $\hat{\beta}_1 = 0.1977$, the t multiplier can be found using a table or software giving $t(n-2, \alpha/2) = 2.0181$, from the ANOVA table $MS(E) = 1.2663$, and that leaves S_{XX}. We know that $SS(R) = \hat{\beta}_1^{\,2} S_{XX}$ implying that $S_{XX} = 26.7651/0.1977^2 = 684.787$. Thus, we are 95% confident that β_1 is in the interval

   $$0.1977 \pm 2.0181\sqrt{(}1.2663/684.787) = (0.1109, 0.2845).$$

2. The CI for a mean response is given by $\hat{\beta}_0 + \hat{\beta}_1 x_0 \pm t(n-2, \alpha/2)\sqrt{MS[E]\left(\frac{1}{n} + \frac{(x_0-\bar{x})^2}{S_{xx}}\right)}$.
   We already have most of the things we need from (1). Our prediction for a biomass of 12 is $0.2798 + 0.1977 * 12 = 2.6522$, the sample size is $n = 44$, and we can find $\bar{x}$= 11.0523 from the correlation output on page **??**. Thus, we are 95% confident that the true mean log biodiesel for a plant with a biomass of 12 is in the interval

   $$2.6522 \pm 2.0181\sqrt{1.2663(1/44 + (12 - 11.0523)^2/684.787)} = (2.3001, 3.0043).$$

3. The PI for a future response is given by $\hat{\beta}_0 + \hat{\beta}_1 x_0 \pm t(n-2, \alpha/2)\sqrt{MS[E]\left(1 + \frac{1}{n} + \frac{(x_0-\bar{x})^2}{S_{xx}}\right)}$.
   Thus, we are 95% confident that a future log biodiesel measurement for a plant with a biomass of 12 is in the interval

   $$2.6522 \pm 2.0181\sqrt{1.2663(1 + 1/44 + (12 - 11.0523)^2/684.787)} = (0.3541, 4.9503).$$

   Note: To make these intervals more meaningful we may want to exponentiate the end points of the intervals to put them on the scale of the original data.

For the matching up of graphs: a=heteroskedasticity, b=nonnormality, c=nonlinearity, and d=model fits.