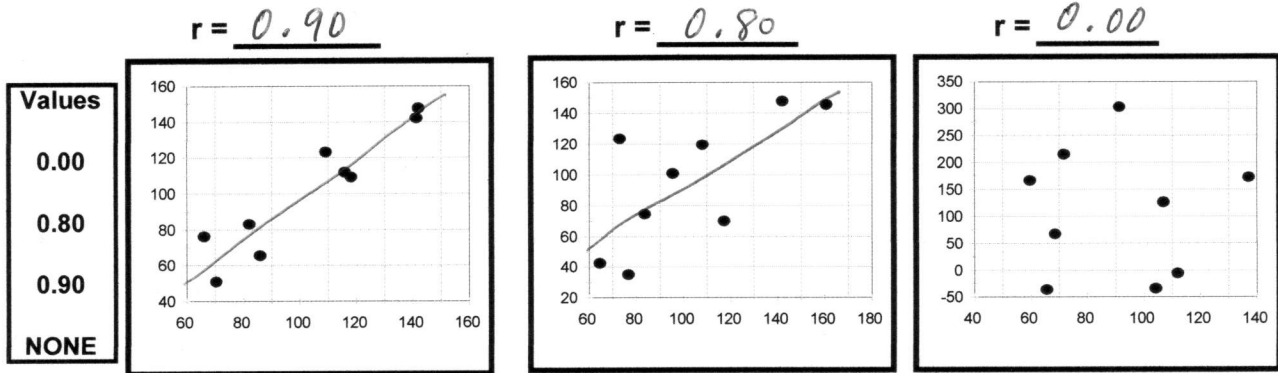


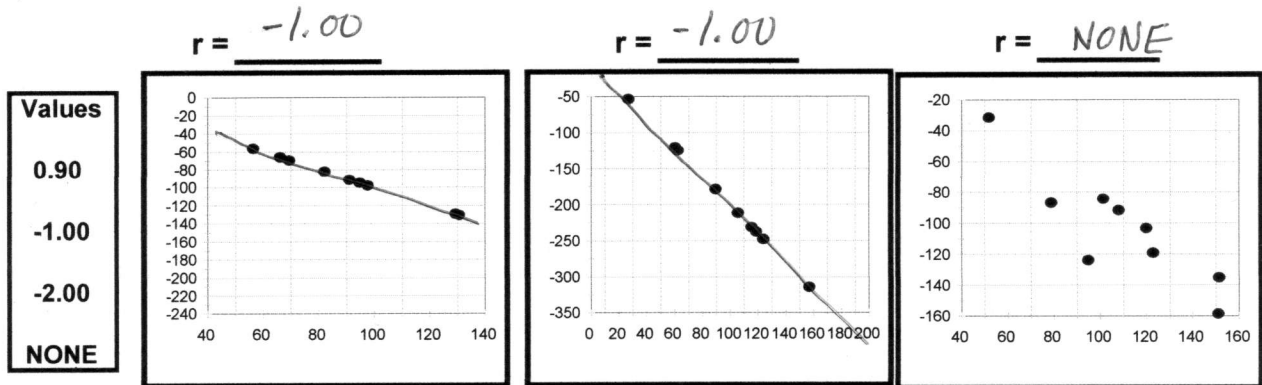
(3 points; 2 minutes)

1. Assign the three sample correlation coefficients to the three pictures. A correlation value may be used more than once or not at all. If a picture has no appropriate correlation available, write NONE [do not use the zero].



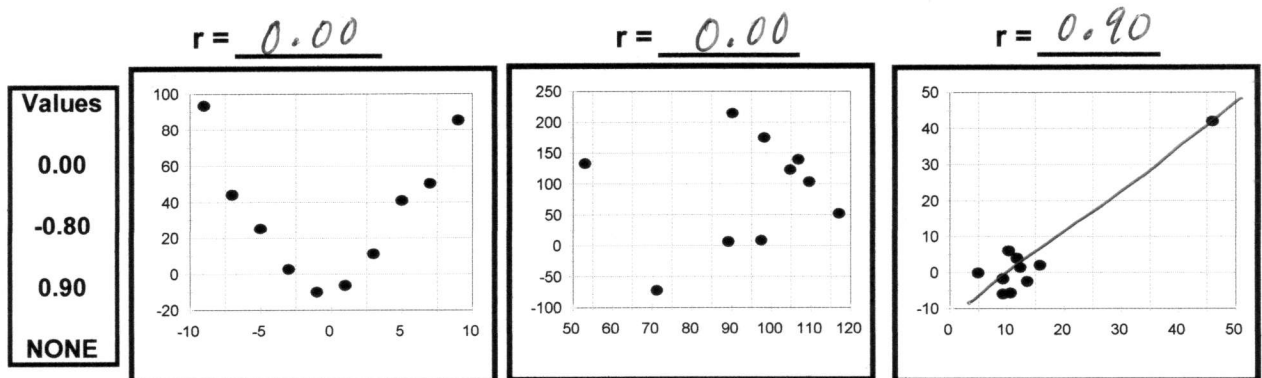
(3 points; 2 minutes)

2. Assign the three sample correlation coefficients to the three pictures. A correlation value may be used more than once or not at all. If a picture has no appropriate correlation available, write NONE [do not put zero].



(3 points; 2 minutes)

3. Assign the three sample correlation coefficients to the three pictures. A correlation value may be used more than once or not at all. If a picture has no appropriate correlation available, write NONE [do not use the zero].



(7 points; 8 minutes)

2. Market research concerning spending patterns found a sample correlation of 0.66 between X=purchase price of house and Y=purchase price of automobile for a sample of 6 families. Use these results to test the claim that the prices paid for houses and cars are positively correlated for the population of all families. (Use a 0.05 significance level for this test.)

$$n = 6 \quad r = 0.66$$

$$\text{claim: } \rho > 0$$

$$H_0: \rho \leq 0$$

$$H_1: \rho > 0$$

$$\alpha = 0.05 \quad \text{right tail}$$

$$\text{Claim: } \rho > 0$$

$$H_0: \rho \leq 0$$

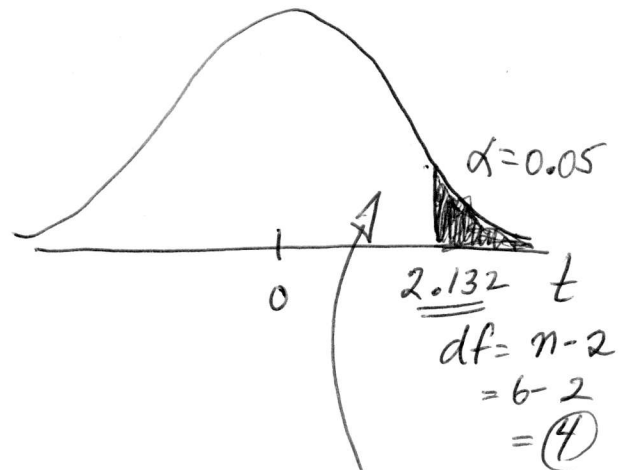
$$H_1: \rho > 0$$

t distribution

Test statistic

$$\frac{r}{\sqrt{\frac{1-r^2}{n-2}}}$$

$$= \frac{0.66}{\sqrt{\frac{1-(0.66)^2}{6-2}}} = \frac{0.66}{0.3756} = 1.757$$

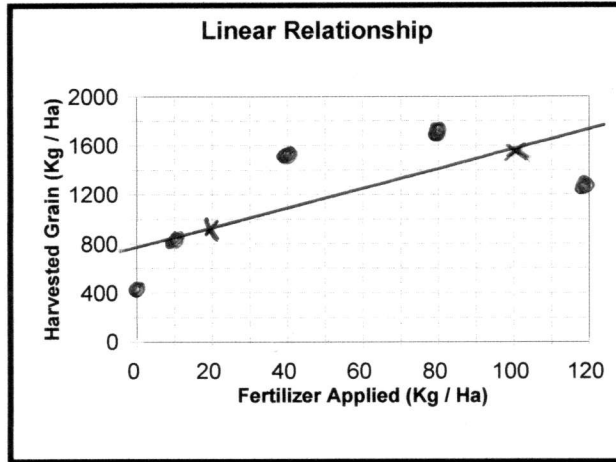


Do not reject H_0

(15 points - 16 minutes)

3. Use the data given below to answer questions (a) through (i).

Test Area	(X) Fertilizer Applied (Kg / Ha)	(Y) Harvested Grain (Kg / Ha)
1	0	429
2	10	859
3	40	1572
4	80	1756
5	120	1256



(a) Plot the data on the coordinate axes.

(b) What is the equation of the least squares regression line for these data : $\hat{y} = 829 + 6.91(x)$

(c) Plot the line on the graph. $(\frac{x}{20}, \frac{\hat{y}}{967})$ $(\frac{x}{100}, \frac{\hat{y}}{1520})$
two points

(d) If a farmer used 30 Kg of fertilizer per hectare, how much grain should be expected? 1036
expected = $\hat{y} = 829 + 6.91(30)$

(e) What is the linear correlation between fertilizer applied and grain harvested? 0.6418
 r from calculator

(f) What is the expression for "total variation in Y" (amounts of grain harvested)? $\sum (y - \bar{y})^2$

(g) What is the value of the total variation in Y, the amounts of grain harvested? 1158101
value of $\sum (y - \bar{y})^2 = S_y^2(n-1) =$

(h) What fraction of the total variation in Y is explained by the regression line? 0.4119
 $r^2 =$ proportion total variation explained by line

(i) What is the expression for "explained variation in Y"? $\sum (\hat{y} - \bar{y})^2$

(j) What is the value of the explained variation in Y? 477022
value = $(r^2)(total) = (0.4119)(1158101)$

(k) What is the expression for "unexplained variation in Y"? $\sum (y - \hat{y})^2$

(l) What is the value of the unexplained variation in Y? 681079
= total - explained

(m) What is the expression for standard error of estimate, S_e ? $\sqrt{\frac{\sum (y - \hat{y})^2}{n-2}}$

(n) Determine the value of the standard error of estimate, S_e ? 476.5

$$= \sqrt{\frac{681079}{3}} =$$