Unit 2 Progress Check: FRQ

1. Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

The following table shows the annual income, in dollars, and amount spent on vacation, in dollars, for a sample of 8 families.

Income	41,100	53,000	27,400	34,400	65,800	98,100	72,000	56,700
Vacation	2,700	2,400	1,700	2,500	2,800	5,100	4,200	3,200

(a) Create a scatterplot of the data in the table.

(b) Describe the association shown in the scatterplot created in part (a).

(c) Calculate the coefficient of determination for the data, and interpret the value in context.

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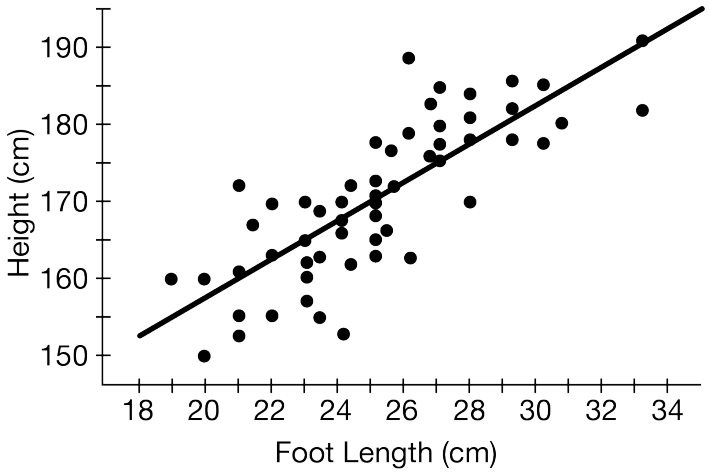
2. Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

A random sample of 65 high school seniors was selected from all high school seniors at a certain high school. The following scatterplot shows the height, in centimeters (cm), and the foot length, in cm, for each high school senior from the sample. The least-squares regression line is shown. The computer output from the least-squares regression analysis is also shown.



Term	Coef	(SE) Coef	T-Value	P-Value
Constant	105.08	6.00	17.51	0.000
Foot length	2.599	0.238	10.92	0.000
$S = 5.90181$		$R\text{–sq} = 65.42\%$		

(a) Calculate and interpret the residual for the high school senior with a foot length of $20\ \text{cm}$ and a height of $160\ \text{cm}$.

(b) The standard deviation of the residuals is $s = 5.9$. Interpret the value in context.

(c) The following histogram summarizes the 65 residuals.

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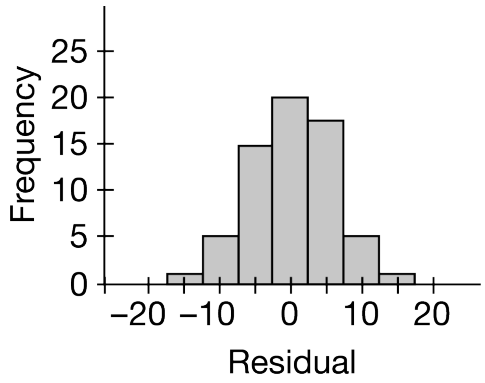

Assume that the distribution of residuals is approximately normal with mean 0 cm and standard deviation 5.9 cm. What percent of the residuals are greater than 8 cm? Justify your answer.

(d) Based on your answer to part (c), would it be surprising to randomly select a high school senior from the high school with a foot length of 20 cm and a height greater than 165 cm? Justify your answer.