Stat Support Activity: Regression Lines

Notes

- **Regression Line ("Line of Best Fit" or "Line of Least Squares") is the line that best fits ordered pair quantitative data.**
- **Regression Line Equation: $\hat{y} = b_0 + (b_1 \times x)$ where b_1 is the slope and b_0 is the y-intercept. Note: Replace b_1 and b_0 with numbers but leave the $\hat{y}$ and the x in the equation.**
- **Slope (b_1) is the amount of increase or decrease in the response variable (y) per unit of x.**
- **Slope Equation: $b_1 = \frac{(r \times s_y)}{s_x}$ where r is the correlation coefficient, s_x is the standard deviation of the explanatory (x) column of data, and s_y is the standard deviation of the response (y) column of data.**
- **Y-intercept Equation: $b_0 = \bar{y} - (b_1 \times \bar{x})$ where b_1 is the slope, $\bar{x}$ is the mean average of the explanatory (x) column of data, and $\bar{y}$ is the mean average of the response (y) column of data.**

Directions: Fill out the following table to calculate the slope and y-intercept for the regression line and then write the regression line equation. Round the slope and y-intercept to the thousandths place (3 numbers to the right of the decimal).

	Correlation Coefficient (r)	*Standard Deviation of x column* (s_x)	*Standard Deviation of y column* (s_y)	Slope $(b_1) = \frac{(r \times s_y)}{s_x}$	*Mean of x column* $(\bar{x})$	*Mean of y column* $(\bar{y})$	Y-intercept (b_0) = $\bar{y} - (b_1 \times \bar{x})$	Regression Line Equation $\hat{y} = b_0 + (b_1 \times x)$
1.	**0.961**	**0.313**	**4.632**		**0.941**	**12.103**		
2.	**−0.575**	**1.288**	**0.341**		**6.591**	**0.527**		
3.	**0.991**	**43.844**	**10.209**		**133.0**	**68.357**		
4.	**−0.358**	**0.099**	**0.054**		**0.763**	**0.453**		
5.	**0.348**	**2.290**	**2.607**		**6.778**	**6.333**		
6.	**−0.711**	**2.182**	**17.433**		**13.4**	**255.6**		
7.	**0.751**	**69.897**	**155.297**		**77.404**	**280.912**		
8.	**−0.649**	**4.116**	**1.792**		**21.725**	**10.388**		