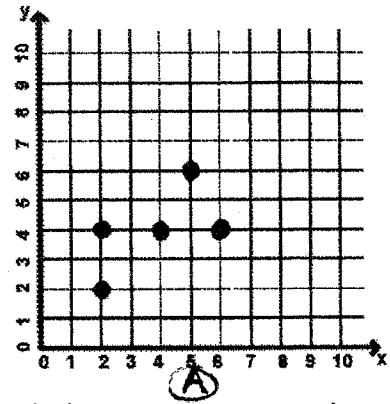Assignment 25:

AP Statistics – Class Activity: The Wayward Point

Once upon a time there was a group of five points. They were really close and enjoyed hanging out in a group.

1) The scatterplot shows the five points (2,2) (2,4) (4,4) (5,6) (6,4).

Find the correlation and the equation of the line of best fit.

r = _____ $\hat{y}$ = _____

2) This hasn't always been an odd group. A long time ago there was a sixth close point. However the other five found out that he was a liar and cast him out. Now he wanders aimlessly through the immense void of the coordinate plane. Recently this wayward point was spotted at three different locations. Investigate the influence of this wayward point on the correlation and equation of the regression line. Also note whether it has a small or large residual. (NOTE: Include the wayward point with the other five at the three locations one at a time. Be sure to remove the previous location when incorporating a new location. There should never be more than six points in the plot!)
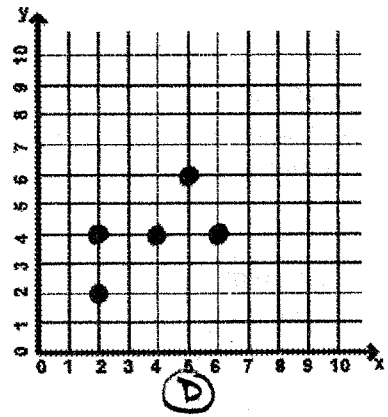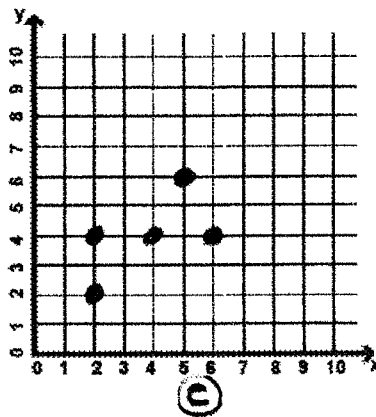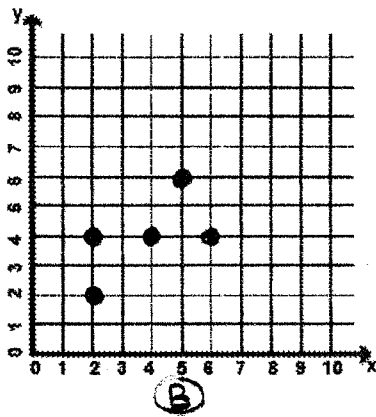
Add the sixth point to the appropriate scatter plot and complete the table below.

Location of the Wayward Point	Description	r	R^2	Equation of the regression line	Size of the residual
(A) None	The group of five alone.				
(B) (10,7)	Far away but consistent w/ the apparent pattern				
(C) (4,9)	Above the center of the original group.				
(D) (8,1)	Far away and also not consistent.				

3) A point that dramatically changes the apparent slope of the regression line is called and *influential* point. You need to be able to spot potential influential points in a scatter plot. What should you look for?

4) Originally there were only five points here. Suppose instead that we had started with 50 points clustered in essentially the same region and displaying an association of roughly the same strength and direction. Would the Wayward Point still be as influential? (Explain)

Where would the Wayward Point have to travel to change the line as dramatically as (8,1) did above?