Problem 1
Evaluate (visually) Pearson, Kendall, and Spearman coefficients of correlation for the data sets below. Explain your answers.

Problem 2
In a normal sample of $N$ ball bearings, the Pearson’s coefficient of correlation between eccentricity and smoothness is $r$. Test the hypothesis $H_0$: “Population correlation is 0” versus $H_a$: “Population correlation is not 0” for the following values:

a) $N = 30, r = 0.1$;  
b) $N = 30, r = -0.5$;  
c) $N = 30, r = 0.9$;  
d) $N = 100, r = 0.1$;  
e) $N = 100, r = 0.5$;  
f) $N = 100, r = -0.9$;

What conclusion can you make about the effect of the sample size on the correlation significance?

Problem 3
Is it possible for a paired sample with 18 distinct observations to have Kendall’s correlation $\tau = 0$? Explain.