SOLUTIONS TO

TEST YOUR KNOWLEDGE: Correlation

A researcher wants to determine whether there is a significant relationship between how much time high school students spend on social media such as Facebook and high school average. She randomly samples 20 students. The data is below:

X (hours spent with social media per week)	Y(high school average)
0	96
0	88
1	67
2	79
3	82
4	88
5	97
6	77
7	88
8	99
9	59
11	58
15	60
18	87
18	64
19	70
20	66
25	70
33	59
40	47

$\sum X = 244$; $\sum Y = 1{,}501$; $\sum XY = 16{,}192$; $\sum X^2 = 5354$; $\sum Y^2 = 116{,}997$

(a) Calculate the correlation coefficient and test for significance.
(b) Explain your results.

$$r = \frac{20(16,192) - 244(1501)}{\sqrt{[20(5354) - (244)^2][20(116,997) - (1501)^2]}} = \frac{-42,404}{64,291.7}$$

$[47,544]$ $[86,939]$

$= -.66$ negative

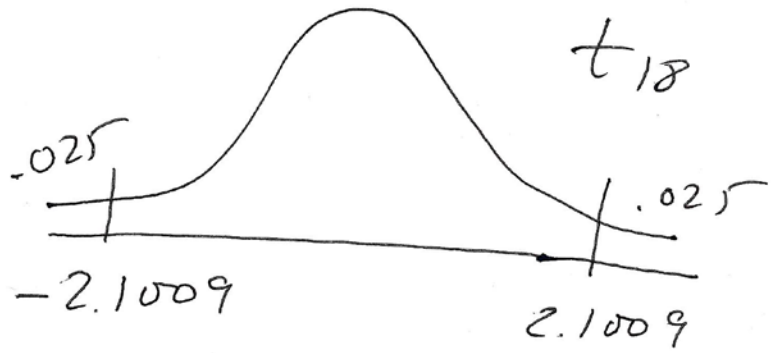
$$t_{18} = \frac{-.66\sqrt{18}}{\sqrt{1-.4356}} = \frac{-2.80}{.75} =$$

$$= -3.73$$

Reject H_0

$H_0: \rho = 0$

$H_1: \rho \neq 0$



The Correlation is significant. There is an inverse relationship between high school average and time spent on Facebook.

r = -.66

r^2 = 43.56%