HYPOTHESIS TEST FOR THE PEARSON'S COEFFICIENT OF CORRELATION

	mean	Std Dev	proportion	Coeff of correlation
populations	μ	σ	p	ρ "rho"
samples	$\bar{x}$	s	$\hat{p}$	r

Step 1

$H_0: \rho = 0$ $\quad$ $H_0: \rho = 0$ $\quad$ $H_0: \rho = 0$

$H_a: \rho \neq 0$ $\quad$ $H_a: \rho > 0$ $\quad$ $H_a: \rho < 0$

Step 2 Test Statistic

$$t = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}}$$

X	Y
1	2
2	4
3	5
4	7
5	8

$r = .99$

$$t = \frac{.99}{\sqrt{\frac{1-.99^2}{5-2}}}$$

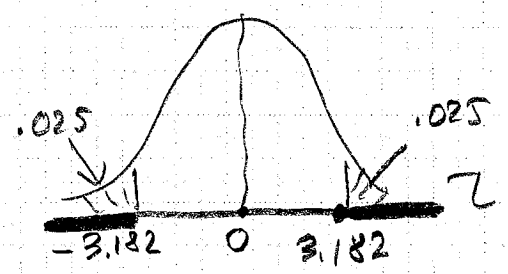
$$\approx 12.16$$

Step 3 Rejection Region (using the t-distribution)

$\alpha = .05 \Rightarrow \alpha/2 = .025$

$df = n-2 = 5-2 = 3$

RR: $t > 3.182$ or $t < -3.182$



Step 4 Decision: Reject H_0

Step 5 Conclusion: "The data provide sufficient evidence, at $\alpha = .05$, to conclude that the Pearson's coefficient of correlation for the population is different than zero"

$H_0: \rho = 0$ equivalent to $H_0: \beta_1 = 0$

$H_a: \rho \neq 0$ $H_a: \beta_1 \neq 0$