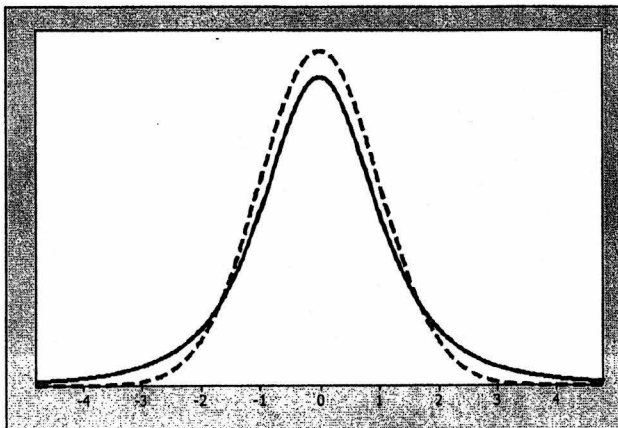1. Below are the graphs of a standard Normal distribution and a t-distribution with 3 degrees of freedom.

   (a) Indicated which graph is which and explain how you know.

   Dotted graph =

   Solid graph =

   (See P. 505)

   (b) On the same figure sketch a graph of a t-distribution with 1 degree of freedom.

2. Find the critical t^* value for each of the following confidence intervals:

   (a) 95% confidence interval with 8 degrees of freedom.

   (b) 80% confidence interval when $n = 20$

3. You want to estimate the mean fuel efficiency of Ford Focus automobiles with 99% confidence and a margin of error of no more than 1 mile per gallon. Preliminary data suggests that $\sigma = 2.4$ miles per gallon is a reasonable estimate of the standard deviation for all cars of this make and model. How large a sample do you need?

4. National Fuelsaver Corporation manufactures the Platinum Gasaver, a device they claim "may increase gas mileage by 30%." Here are the percent changes in gas mileage for 15 identical, randomly-selected vehicles, as presented in one of the company's advertisements:

-2.4	6.9	10.4	10.8	24.8
28.7	28.7	33.7	34.6	38.5
40.2	44.6	46.8	46.9	48.3

(a) The sample mean is $\bar{x} = 29.43$ and the sample standard deviation is $s = 16.23$. Calculate and interpret the standard error of the mean for these data.

(b) Construct and interpret a 90% confidence interval to estimate the mean change (in percent) in gas mileage. Does the data support the company's claim? Use the four-step process. ⟩ PAIS