28. Determine the values of the following quantities.

a. \( t_{1.15} \)  

b. \( t_{0.05.15} \)  

c. \( t_{0.05.25} \)  

d. \( t_{0.05.40} \)  

e. \( t_{0.005.40} \)  

29. Determine the \( t \) critical value that will capture the desired \( t \) curve area in each of the following cases.

a. Central area \( = .95 \), df = 10

b. Central area \( = .95 \), df = 20

c. Central area \( = .99 \), df = 20

d. Central area \( = .99 \), df = 50

e. Upper-tail area \( = .01 \), df = 25

f. Lower-tail area \( = .025 \), df = 5
30. Determine the $t$ critical value for a two-sided confidence interval in each of the following situations.

a. Confidence level $= 95\%$, df $= 10$

b. Confidence level $= 95\%$, df $= 15$

c. Confidence level $= 99\%$, df $= 15$

d. Confidence level $= 99\%$, $n = 5$

e. Confidence level $= 98\%$, df $= 24$

f. Confidence level $= 99\%$, df $= 38$

32. A random sample of $n = 8$ E-glass fiber test specimens of a certain type yielded a sample mean interfacial shear yield stress of 30.2 and a sample standard deviation of 3.1. Assuming that interfacial shear yield stress is normally distributed, compute a 95% CI for the true average stress.
33. The article “Measuring and Understanding the Aging of Kraft Insulating Paper in Power Transformers” (IEEE Electrical Insul. Mag., 1996: 28-34) contained the following observations on degree of polymerization for paper specimens for which viscosity times concentration fell in a certain middle range:

\[
\begin{array}{cccccccccc}
418 & 421 & 421 & 422 & 425 & 427 & 431 \\
434 & 437 & 439 & 446 & 447 & 448 & 453 \\
454 & 463 & 465 & \\
\end{array}
\]

(a) Calculate a two-sided 95% confidence interval for true average degree of polymerization (as did the authors of the article). Does the interval suggest that 440 is a plausible value for the true average degree of polymerization? What about 450?

35. Silicone implant augmentation rhinoplasty is used to correct congenital nose deformities. The success of the procedure depends on various biomechanical properties of the human nasal periosteum and fascia. The article “Biomechanics in Augmentation Rhinoplasty” (J. of Med. Engr. and Tech., 2005: 14-17) reported that for a sample of 15 (newly deceased) adults, the mean failure strain (%) was 25.0, and the standard deviation was 3.5.

(a) Assuming a normal distribution for failure strain, estimate the true average strain in a way that conveys information about precision and reliability.