STAT 400 SUMMER II 2001 (PROFESSOR GREEN)
SOLUTIONS TO PROBLEMS: DUE AUGUST 13

28.

(a) 1.341
(b) 1.753
(c) 1.708
(d) 1.684
(e) 2.704

32. (27.61, 32.79)

34.

(a) Assuming that the limit stress is normally distributed (to a good approximation), a 95% confidence lower bound is 8.106 MPa.
(b) 7.032 is a 95% Confidence lower bound for a single measurement.

36.

(a) 378.85
(b) 413.093. This is much higher, since it is a prediction for a single individual rather than for a population mean. If the population mean and standard deviation were known, this would be 1.96 standard deviations above the mean. In the absence of this knowledge, the upper bound is higher than the sample mean plus 1.96 times the sample standard deviation because of the additional uncertainty.
(c) Since X_{new} has mean μ and variance $\frac{\sigma^2}{2}$, the prediction formula changes by substituting $\frac{1}{2}+\frac{1}{n}$ for $1+\frac{1}{n}$ in the formula on page 300. This gives (333.875, 407.505) as the desired two-sided interval.

38.

(a) On the basis of the given data, a 90% confidence interval for the warpage of a single specimen is given by (.05216,.07484) , a 95% confidence interval by (.04982,.07718) , and a 99% confidence interval by (.04496,.08204).
(b) This requires the table of tolerance critical values. The 99% tolerance critical value for a twosided 95% tolerance interval is 2.972. This gives a tolerance interval of (.04418, .08282).