Due Jan. 23 Ch. 1 set A: 1-7
(1) Show the following equivalent definitions for variance: $E(X - \mu)^2 = EX^2 - \mu^2$
(2) Calculate the mean and standard deviation of a Binomial $(n, p)$ rv.
(3) Calculate the variance of a Normal $(0, \sigma)$ rv.

Due Feb. 3 Ch. 2 set A: 1-4, set B: 1-4, 6, 8-12
Due Feb. 8 (586 students) Lab 1 (p. 295). Also, prove the Cauchy-Schwarz inequality
\[(\sum_{i=1}^{n} a_i b_i)^2 \leq (\sum_{i=1}^{n} |a_i|^2)(\sum_{i=1}^{n} |b_i|^2).\]
Use this to show that the correlation coefficient satisfies $|r(x, y)| \leq 1$.

Due Feb. 10 Ch. 2 set B: 14, Ch. 3 set A: 4-6, set B: 3, 5, 12, 15, set C: 1, 4
Due Feb. 15 (586 students) Lab 2 (p. 296).
Due Feb. 17 Ch. 3 set D: 1, 3, 5, 7b, set E: 1, 5, 6, 7
Due Mar. 7 For this homework, use a calculator and the following data taken from iid random variables: $(21, 21, 23, 24, 26, 29, 29, 30, 31)$.
(a) Find a 95.4 percent Confidence Interval for the true mean of the distribution.
(b) If $\mu = 23.5$ and $\sigma = 3.6$, find the z-value, t-value, and their corresponding p-values.
(c) Suppose $\mu = 23.5$ and $\sigma = 3.6$ for the larger ambient population (the distribution from which the above data is observed is the distribution of this ambient population). Using the significance level $\alpha = .046$, do we accept the null hypothesis, $H_0$, that the true mean of our data sample is $\mu_0 = 23.5$? Use both the Z-test and the t-test.
(d) Repeat (c) with data: $(52.6, 54.7, 56.4, 61.8, 63.9, 65.1, 68.1, 75.2, 82.3, 87.7)$, $\alpha = .046$, $\sigma = 13$ and the null hypothesis $H_0 : \mu_0 = 75$.
Due Mar. 16 Ch. 7 set A: 2, 3, 4, 6, 8, 9; Ch. 4 set A: 1, 2, 5
Due Mar. 28 (586 students, extra cred for 486 students) Lab 3 (p. 297).
Due Mar. 28 Ch. 3 set B: 14(a-f); Ch. 4 set B 3(prove it), 5, 8, 11, 13, 14, set C: 1
Due Apr. 11 (586 students, extra cred for 486 students) Lab 4 (p. 297).
Due Apr. 27 (586 students, extra cred for 486 students) Lab 5 (p. 298).