Name:

Due date: Wednesday, June 5.
Reading: Chapter 8: $28, 29, 31, 32, 36, 37, 38, 56, 59$.

28 Use the z-table in Appendix A, find the value of z that satisfies the following properties

(a) $P(Z \leq z) = 0.8238$

(b) $P(Z \leq z) = 0.0287$

(c) $P(Z \geq z) = 0.9115$

(d) $P(Z \geq z) = 0.1660$

(e) $P(|Z| \geq z) = 0.10$

(f) $P(|Z| \leq z) = 0.95$

29 Let z be the standard normal random variable. If $z > 0$ and $F_z(z) = \alpha$, what are $F_z(-z)$ and $P(-z \leq Z \leq z)$?

31 An insurance company has 5000 policies and assumes these policies are all independent. Each policy is governed by the same distribution with a mean of \$495 and a variance of \$30,000. What is the probability that the total claims for the year will be less than \$2,500,000?

32 A company manufactures engines. Specifications require that the length of a certain rod in this engine be between 7.48 cm. and 7.52 cm. The lengths of the rods produced by their supplier have a normal distribution with a mean of 7.505 cm. and a standard deviation of 0.01 cm.

(a) What is the probability that one of these rods meets these specifications?

(b) If a worker selects 4 of these rods at random, what is the probability that at least 3 of them meets these specifications?

36 If $Y = e^X$, where X is a normal random variable with $\mu = 5$ and $\sigma = 0.40$, what are $E[Y]$ and $\mathrm{Var}[Y]$?

37 If Y is log-normal and X, the normally distributed exponent, has parameters $\mu = 5.2$ and $\sigma = 0.80$, what is $P(100 \leq Y \leq 500)$?

38 The claim severity random variable for an insurance company is log-normal, and the normally distributed exponent has mean 6.8 and standard deviation 0.6. What is the probability that a claim is greater than \$1750?

56 The time to a failure of a component in an electronic device has an exponential distribution with a median of four hours. Calculate the probability that the component will work without failing for at least five hours.

59 The number of days that elapse between the beginning of a calendar year and the moment a high-risk driver is involved in an accident is exponentially distributed. An insurance company expects that 30% of high-risk drivers will be involved in an accident during the first 50 days of a calendar year. What portion of high-risk drivers are expected to be involved in an accident during the first 80 days of a calendar year?