CHAPTER 2 REVIEW

1. Maple tree diameters in a forest area are normally distributed with mean 10 inches and standard deviation 2.2 inches. Find the proportion of trees having a diameter greater than 15 inches.

2. Our subjects are 35-44-year-old males whose blood pressures are normally distributed with mean 80 and standard deviation 12.
    a. A borderline hypertensive is defined as a person whose diastolic blood pressure is between 90 and 95 mm Hg inclusive. What proportion of subjects are borderline hypertensive?
    b. A hypertensive is a person whose diastolic blood pressure is above 95 mm Hg. What proportion of subjects are hypertensive?

3. White blood cell (WBC) count per cubic millimeter of whole blood has approximately the N(7500, 1750) distribution. The lowest 2% of all WBC counts are defined to be probable risks. How low must one's WBC count be to fall in the at-risk group?

4. Glaucoma is a disease of the eye that is manifested by high intraocular pressure. The distribution of intraocular pressure in the general population is approximately normal with mean 16 mm Hg and standard deviation 3.2 mm Hg. If the normal range for intraocular pressure is between 10 and 22 mm Hg, than what proportion of the general population would fall within this range?

5. The resting heart rate for healthy adult horses averages 46 beats per minute with a standard deviation of 8 beats per minute. A horse whose resting heart rate is in the upper 10% of the distribution of heart rates may have a secondary infection or illness that needs to be treated. How fast must a healthy horse's heart be beating to fall into this at-risk group?

6. The length of elephant pregnancies from conception to birth varies according to a distribution that is approximately normal with mean 525 days and standard deviation 32 days.
    a. What percent of pregnancies last more than 600 days (that’s about 20 months)?
    b. What percent of pregnancies last between 510 and 540 days (that’s between 17 and 18 months)?
    c. How short do the shortest 10% of all pregnancies last?

7. Wingspans of adult herons have approximate normal distribution with mean 125 cm and standard deviation 12 cm.
    a. What proportion of herons have wingspan more than 140 cm?
    b. What is the median wingspan?

8. The grading at Central High gives a B for grades between 86 and 93. On the English final for seniors, what proportion of the class would get a B if the grades were normally distributed with a mean grade of 86.34 and standard deviation of 14.23?

9. The mean GPA for Central High is 2.9, with the standard deviation of 0.5. Assuming the GPAs are normally distributed, what GPA score will place a student in the top 5% of the class?

10. On Kaylani's last two biology exams, she scored an 87. The class mean on the first exam was 75, with a standard deviation of 8.9. The class average on the second exam was 73, with a standard deviation of 9.7. Assuming the scores on the exam were approximately normally distributed, on which exam did Kaylani score better relative the rest of her class?

11. Which of the following statements is not true for normally distributed data?
    (a) The mean and median are equal.
    (b) The area under the curve is dependent upon the mean and standard deviation.
    (c) Almost all of the data lie within three standard deviations of the mean.
    (d) Approximately 68% of all of the data lies within one standard deviation of the median.
    (e) When the data are normalized, the distribution has a mean $\mu = 0$ and standard deviation $\sigma = 1$.

12. Railroad freight cars filled with coal have weights that are approximately normally distributed with a mean of 72 tons and a standard deviation of 9 tons. A train of 50 coal cars is compiled. The engine assigned to pull the trail can pull a maximum weight of 3,750 tons.What percentage of all coal cars weigh less than 74 tons?

13. Suppose that the average height of adult males in a particular locality is 70 inches with a standard deviation of 2.5 inches.
    (a) If the distribution is normal, the middle 95% of males are between what two heights?
    (b) What percentage of the heights are between z-scores of ± 1? Of ± 2? Of ± 3?