AP Statistics – Review of the Normal Distribution (Chapter 2.2) (answers in blue)

Using the 68-95-99.7 Rule

SAT (combined) scores of college-bound seniors in high school has the normal distribution with mean 1050 and standard deviation 150.

1. Sketch a normal curve that matches the information above. **Curve sketch**

Use your curve and the 68-95-99.7 rule to answer the following

2. What is the middle 68% of the distribution of SAT score of a college-bound senior? **900-1200**
3. Find the percent of students that score between 900 and 1500. **83.85%**
4. Find the value x such that the 16% of all seniors have SAT score below x. **900**
5. What is the 97.5th percentile of this distribution? **1350**

Standard Normal Calculations

6. The angiogram is a standard diagnostic test used in clinical medicine to detect stroke in patients. This test has some risks for the patient, and several noninvasive techniques have been developed that are hoped to be as effective as the angiogram. One such method utilizes that measurement of cerebral blood flow (CBF) in the brain, since stroke patients tend to have lower levels of CBF than normal. Among healthy people, CBF is normally distributed with mean 75 and standard deviation 17. Patients are classified as being at risk for stroke if their CBF is below 40. What proportion of normal patients will be classified as being at risk for stroke? **.0197**

7. 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. **.0116**

8. Our subjects are 35-44-year-old males whose blood pressures are normally distributed with mean 80 and standard deviation 12; N(80, 12). 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? A hypertensive is a person whose diastolic blood pressure is above 95 mm Hg; what proportion of subjects are hypertensive? **.0977, .1056**

9. 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? **.9398**

Inverse Normal Calculations

10. 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? **3912.5**

11. 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 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? **56.24**

12. The Graduate Record Examination (GRE) is widely used to help predict the performance of applicants to graduate school. The range of possible scores on a GRE is 200 to 900. The math department at a university finds that the scores of its applicants on the verbal portion of the GRE (VGRE) are approximately normal with mean $\mu = 612$ and standard deviation $\sigma = 103$. To be accepted into a graduate program at this university, a student must score in the top 25% of the GRE. What score must a student get to be accepted? **681.01**