Normal distributions practice 2 NAME:

For each problem 1 – 5, draw the normal curve with the appropriate area shaded. Then find the standard score (from Table B from the book, page 547) and use it to find the desired percentage.

1. The annual rate of return on stock indexes (which combine many individual stocks) is roughly normal. Since 1945, the Standard & Poor's 500 index has had a mean yearly return of 12% with a standard deviation of 16.5%. Take this normal distribution to be the distribution of yearly returns over a long period. Find the percent of returns that yield more than 30%.

2. For a certain year, the math SAT scores were roughly normal with a mean of 500 and a standard deviation of 110. If I scored 350 on my SAT that year, what percentile am I in? (In other words, what percent of the test takers scored less than me?)

3. The heights of women are normally distributed with a mean of 65 inches and a standard deviation of 2.5 inches. My mother is 5'6" (or 66 inches). Find the percentage of women that are shorter than my mother.

4. Use the percentage you found in #3 to find the percentage of women who are taller than my mother. Show work.

5. The Wechsler IQ tests for children are normally distributed with a mean of 100 and a standard deviation of 15. If I score 140 on this test, what percent of people did I score better than?

6. Fast Auto Service provides oil and lube service for cars. It is known that the mean time taken for oil and lube service at this garage is 15 minutes with a standard deviation of 2.4 minutes. The manager wants to promote the business by guaranteeing a maximum waiting time for its customers. If a customer's car is not finished within this time, they will get a 50% discount. The manager wants to limit this discount to at most 5% of its customers. What should the guaranteed maximum waiting time be set at? (Hint: This problem starts off by giving you the percentage under the curve. You need to find the corresponding standard score, and then convert it to a time in minutes using the relationship $st.score = \frac{observation - mean}{st.dev.}$.) Also provide a drawing of the normal curve with the appropriate area shaded and the guaranteed maximum waiting time indicated.