

Test Your Understanding - Normal

1. A machine used to regulate the amount of dye dispensed for mixing shades of paint can be set so that it discharges an average of  $\mu$  milliliters of dye per can of paint. The amount of dye discharged is known to have a normal distribution with a standard deviation of .6 milliliter. If more than 9 milliliters of dye are discharged when making a particular shade of gray paint, the shade is unacceptable. Determine the setting for  $\mu$  so that only 2 percent of the cans of paint will be unacceptable.
2. A physical fitness association is including the mile run in their secondary school fitness test for boys. The time for this event for boys is approximately normally distributed with a mean of 428 seconds and a standard deviation of 30 seconds. If the association wants to designate the fastest 5% as “excellent”, what time should the association set for this criterion?
3. The board of examiners that administers the real estate broker’s examination in a certain state found that the mean score on the test was 485 and the standard deviation was 88. If the board wants to set the passing score so that only the best 20% of all applicants pass, what is the lowest passing score? Assume the scores are approximately normally distributed.
4. The distribution of the demand (in number of units per unit time) for a product can often be approximated by a normal probability distribution. For example, a bakery has determined that the number of loaves of its whole wheat bread demanded daily has a normal distribution with a mean of 5800 loaves and a standard deviation of 250 loaves.
  - a) Based on cost considerations, the company has decided that its best strategy is to produce a sufficient number of loaves so that it will fully supply demand on 97% of all days. How many loaves should the company produce each day?
  - b) Based on the production in part a), on what percentage of days will the company be left with more than 400 loaves of unsold bread?