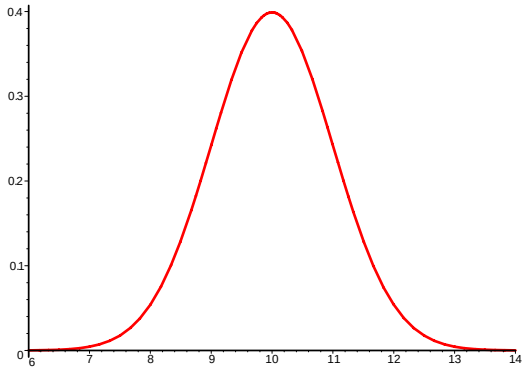
Math 119B Spring 2007
Newberger

Worksheet: Normal Random Variables

Suppose that X is a normally distributed random variable with mean $\mu = 10$ and standard deviation $\sigma = 1$.



1. Label the mean μ on the graph.
2. What is the total area under the curve? _____
3. Find the probability that X is less than the mean, by following the steps below.
   a. This question is asking you to find $P(X < \_\_\_\_\_)$.
   b. Find the z-score for $x = 10$. The formula for the z-score of x is $z = \frac{x-\mu}{\sigma}$.

      Then $P(X < 10) = P(Z < \_\_\_\_\_)$.
   c. Use the table to find this probability.

4. Find the probability that X is within one standard deviation of the mean, following the steps below.
   a. This question is asking you to find $P(\_\_\_\_\_ < X < \_\_\_\_\_)$.

      Sketch the normal curve for this random variable and shade the region corresponding to this probability.

   b. Write the probability as the difference of two probabilities of the form $P(X < c)$.

      $P(\_\_\_\_\_ < X < \_\_\_\_\_) = P(X < \_\_\_\_\_) - P(X < \_\_\_\_\_)$.
   c. Find the z-scores, and use the table to complete the problem.