MAT 112 Worksheet
Wednesday, October 24, 2007

1. Find the area under the standard normal distribution between
   (a) $z = 0$ and $z = 2.34$
   (b) $z = 0$ and $z = 1.27$
   (c) $z = -1.23$ and $z = 0$
   (d) $z = -2.21$ and $z = 1.14$
   (e) $z = 1.21$ and $z = 2.41$

2. Let $x$ be a normally distributed continuous random variable with $\mu = 15$ and $\sigma = 4$.
   (a) Convert $x = 22$ to a $z$-value
   (b) Convert $x = 12$ to a $z$-value
   (c) Convert $x = 20$ to a $z$-value
3. Let \( x \) be a normally distributed continuous random variable with \( \mu = 22 \) and \( \sigma = 7 \).

   (a) Find \( P(22 < x < 32) \)

   (b) Find \( P(10 < x < 22) \)

   (c) Find \( P(16 < x < 25) \)

   (d) Find \( P(24 < x < 30) \)

   (e) Find \( P(9 < x < 18) \)

4. According to a 2002 study by the State Public Interest Research Group’s Higher Education Project, the average debt of graduating college seniors was $16,928, with a standard deviation of $2,521. Assuming that these data are normally distributed.

   (a) Find the probability that a randomly selected college student has debt between $18,000 and $20,000.

   (b) Find the probability that a randomly selected college student has debt less than $12,000.