Problem #14

Replacement times for CD players are normally distributed with a mean of 7.1 years and a standard deviation of 1.4 years.

a. Find the probability that a randomly selected CD player will have a replacement time less than 8.0 years.

From Table A-2, .5 + .2389 = .7389

If you prefer using a TI-83, normalcdf(-999,8.0,7.1,1.4) = .7398 which gives a slightly different answer.

The probability that a randomly selected CD player has a replacement time less than 8 years is .7389. Or 73.89% of the CD players have replacement times less than 8 years.

b. If you want to provide a warranty so that only 2% of the CD players will be replaced before the warranty expires, what is the time length of the warranty?

Using Table A-2, look up .48 in the body of the table. It isn't there. So, the closest area (probability) is .4798. The z score that corresponds is 2.05. Because the score is to the left of the mean, we will use -2.05.

So, $x = \mu + z \cdot \sigma = 7.1 - 2.05(1.4) = 4.2$

If you prefer using a TI-83, invNorm(.02,8.0,1.4)=4.2

We would provide a 4.2 year warranty for the CD players so that only 2% of them need to be replaced before the warranty expires.