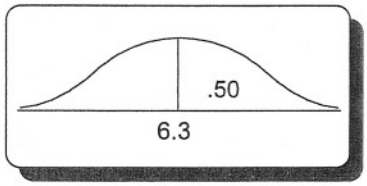
II. The number of customers returning merchandise to Darin's Music Emporium is normally distributed with a mean of 6.3 per week and a standard deviation of 1.5. Given the following probabilities, calculate the appropriate value or values for x.

A. Half of the time, returns will be above 6.3 per week.

B. Ninety percent of the time returns will be below 8.2.



50% -10% = 40% → $Z = 1.28$

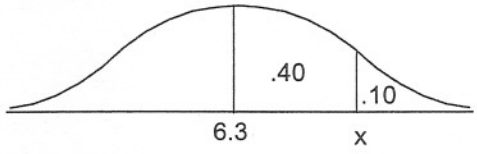
Note: Use only the plus sign because the top 10% is to the right of 6.3.

$\mu \pm z\sigma$

$6.3 + 1.28(1.5)$

$6.3 + 1.92$

$= 8.2$



C. Find the interquartile range for returns to Darin's Music Emporium.

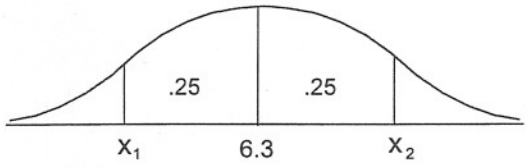
25% → $Z = .67$

$\mu \pm z\sigma$

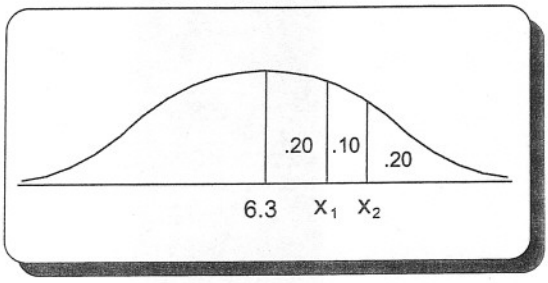
$6.3 \pm .67(1.5)$

6.3 ± 1.005

$5.3 \leftrightarrow 7.3$



D. Draw a graph of the eighth decile for returns to Darin's Music Emporium.



III. A recent study indicated 5% of Darin's customers return merchandise sold for credit. What is the probability of Darin having less than 20 returns for a 500 credit sales week?

The normal approximation of the binomial may be used when $n \geq 30$ and both np and nq are ≥ 5.

$n = 500$, $np = 500 \times .05 = 25$, and $nq = 500 \times .95 = 475$ The normal approximation may be used.

Given:

p = .05

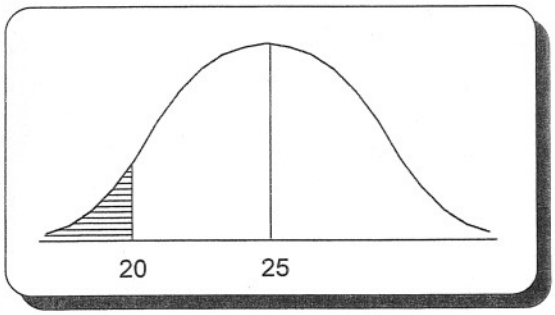
n = 500

x = 20

$\mu = np = (500)(.05) = 25$

$\sigma = \sqrt{npq}$

$= \sqrt{500(.05)(.95)} = \sqrt{23.75} = 4.8734$



$$Z = \frac{x-\mu}{\sigma} = \frac{19.5-25.0}{4.8734} = -1.13 \rightarrow .3708$$

50.00% - 37.08% = 12.92%

Note: Because the question's range does not include 20, 20's lower limit of 19.5 is used for x.