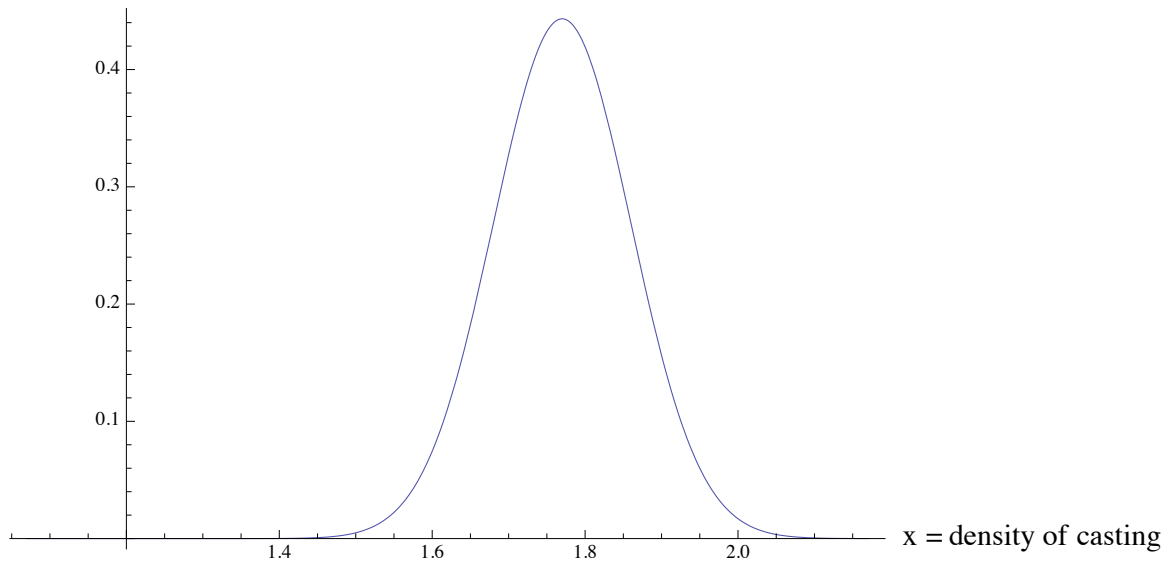

Assignment due 7-19-10

1. Metal castings have a density x that is normal (bell) distributed with a mean of 1.77 and a standard deviation of 0.09.

a. Sketch the density and label the mean and standard deviation as recognizable elements of your sketch.



b. Give a 68% interval for casting density and identify it by shading an area under curve (a).

c. Give a 95% interval for casting density.

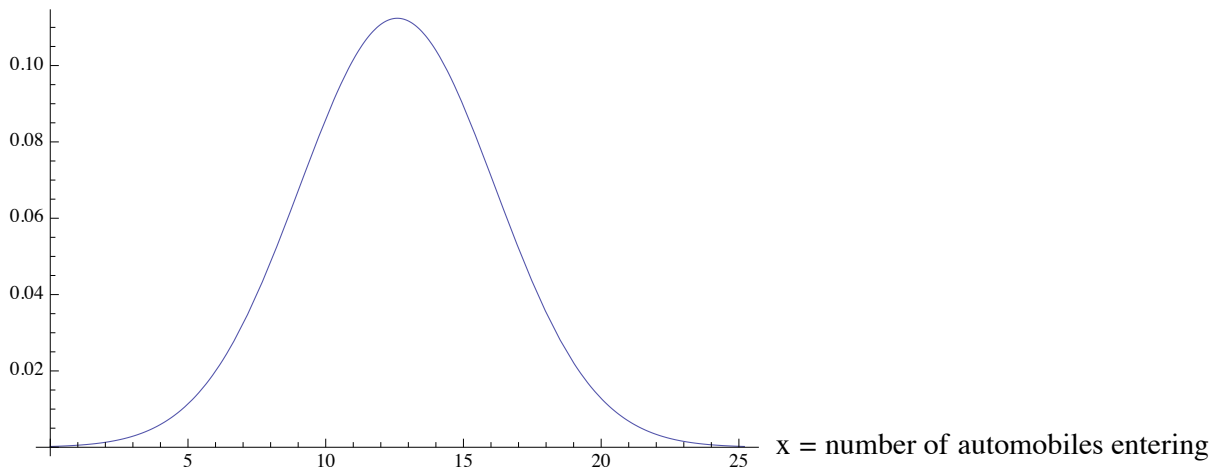
d. Give the area under curve (a) left of 1.77.

e. Determine the standard score z of a casting whose density is 1.8.

f. Use (e) and the table of page 210 (Normal Curve Areas) to ascertain the probability of a casting between density score 1.77 and density score 1.8.

2. A Poisson distribution whose mean μ is at least 10 is fairly well approximated by a normal distribution having that mean and a standard deviation of $\sqrt{\mu}$. The distribution of the number of automobiles entering a service station in 30 minutes is thought to follow the Poisson distribution with mean $\mu = 12.6$.

a. Sketch the *approximate* density and label the mean and standard deviation as recognizable elements of your sketch.



b. Give a 68% interval for the number of automobiles entering and identify it by shading an area under curve (a).

c. Give a 95% interval for the number of automobiles entering.

d. Determine the standard score z of $x = 20$.

e. Use (d) and the table of page 210 (Normal Curve Areas) to ascertain the probability of having fewer than 20 automobiles entering during a 30 minute period.

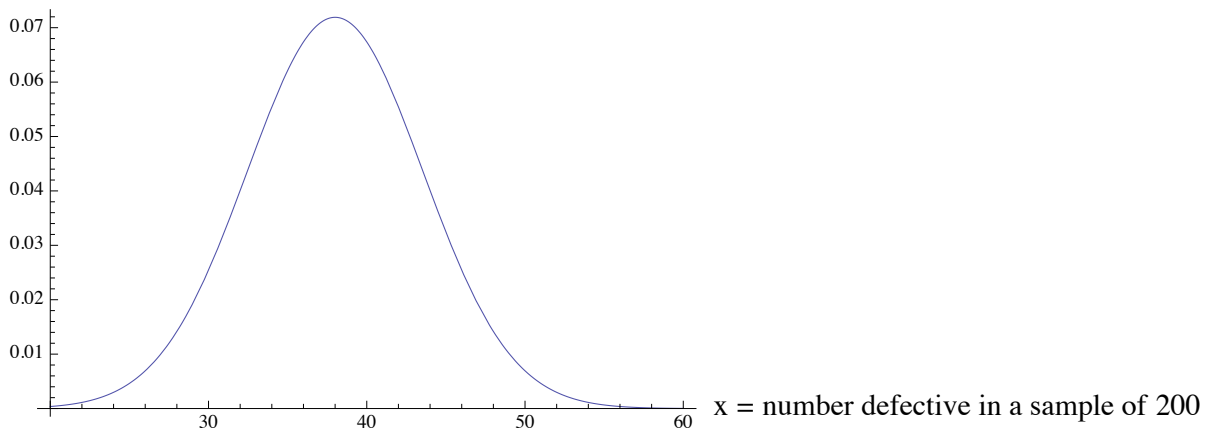
3. The binomial distribution with n and p satisfying

" np and $n(1-p)$ are each at least 10"

is satisfactorily approximated by a normal distribution having mean np and standard

deviation $\sqrt{np(1-p)}$. The probability that any given part is defective is 0.19. We independently sample 200 parts from production. Let X be the number of defective parts in the sample of 200.

a. Sketch the *approximate* density and label the mean and standard deviation of X as recognizable elements of your sketch.



b. Give a 68% interval for the number of defective parts in a sample of 200 and identify it by shading an area under curve (a).

c. Give a 95% interval for the number of defective parts in a sample of 200.

d. Determine the standard score z of $x = 50$.

e. Use (d) and the table of page 210 (Normal Curve Areas) to ascertain the probability of having more than 50 defective parts in a sample of 200.