NAME(S)_____

Virtual Lab Activity: *The Gamma Distribution*

[The Virtual Laboratory for Probability and Statistics was developed by Dr. Kyle Siegrist at UAH.]

Go to www.math.uah.edu/stat/

Select

5. Special Distributions
3. The Gamma Distribution

Note: *The text uses α and β for Gamma parameters. In the virtual lab, k = α and b = β. In the quantile applet, the "quantile" refers to the value of the random variable from the specified distribution. The "prob" is the cumulative probability as shown in the graph. Just like in the text table, the cumulative probability can be used to find the probability in any interval.*

Read the lesson. Open the quantile applet from #9, and answer the following questions.

1. Select the normal distribution with $\mu = 0$, and $\sigma = 1$.

   a. $P(X < 1) =$ _____

   b. $P(X < -1) =$ _____

   c. $P(-1 < X < 1) =$ _____

   d. At the 35^{th} percentile, $X =$ _____

2. Select the gamma distribution with $\alpha = 2$ and $\beta = 1$.

   $P(1.8 < X < 2.4) =$ _____

3. Select the gamma distribution with $\alpha = 1$ and $\beta = 4$. (Recall that the distribution is exponential when $\alpha = 1$.)

   $P(X < 3) =$ _____

4. In an exponential distribution with $\beta = 10$, the value of the random variable at the 90^{th} percentile is _____.

5. a. Select the gamma distribution with $\alpha = 20$ and $\beta = 1$

      $P(X < 25) =$ _____

   b. In the normal approximation for the previous probability,

      $\mu =$ _____ and $\sigma =$ _____

      and $P(X < 25) \approx$ _____