Name _____ Score _____ Teacher _____ Date _____

Exponential Distribution

Let T be a nonnegative waiting time with positive rate lambda. Convert between rate and mean in matching units. Use a calculator for exponential and logarithm values. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation. Round requested quantiles as stated.

1. Let T be an exponential waiting time in hours with mean waiting time 0.8 hours, so lambda = 1/mean > 0. Find the mean and population variance of T.

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

2. Let T be an exponential waiting time in minutes with positive rate lambda = 0.5 per minute. Find P(2 < T <= 10).

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

Keep rate and exposure units consistent. Round only the final result.

Name _____ Score _____ Teacher _____ Date _____

Exponential Distribution

Let T be a nonnegative waiting time with positive rate lambda. Convert between rate and mean in matching units. Use a calculator for exponential and logarithm values. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation. Round requested quantiles as stated.

3. **Let T be an exponential waiting time in hours with mean waiting time 5 hours, so lambda = 1/mean > 0. Find P(T > 8).**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

4. **Let T be an exponential waiting time in hours with positive rate lambda = 0.125 per hour. Find q such that P(T <= q) = 0.2. Round q to the nearest thousandth.**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

Name _____ Score _____ Teacher _____ Date _____

Exponential Distribution

Let T be a nonnegative waiting time with positive rate lambda. Convert between rate and mean in matching units. Use a calculator for exponential and logarithm values. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation. Round requested quantiles as stated.

5. **Let T be an exponential waiting time in minutes with positive rate lambda = 0.25 per minute. Given that T > 0.5, find P(T > 6.5 | T > 0.5).**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

6. **Let T be an exponential waiting time in minutes with mean waiting time 0.5 minutes, so lambda = 1/mean > 0. Find P(T <= 4).**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

Keep rate and exposure units consistent. Round only the final result.

Name _____ Score _____ Teacher _____ Date _____

Exponential Distribution

Let T be a nonnegative waiting time with positive rate lambda. Convert between rate and mean in matching units. Use a calculator for exponential and logarithm values. Round final probabilities to the 3 decimal places; if that would display 0, use scientific notation. Round requested quantiles as stated.

7. **Let T be an exponential waiting time in hours with mean waiting time 2 hours, so lambda = 1/mean > 0. Find P(T > 4).**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

8. **Let T be an exponential waiting time in hours with positive rate lambda = 0.2 per hour. Given that T > 2, find P(T > 7 | T > 2).**

Assumptions: The waiting time is nonnegative and exponential with one constant positive rate; the process is stationary and memoryless.

Reference: F(t)=1-exp(-lambda t), P(T>t)=exp(-lambda t), and mean=1/lambda for t>=0. Calculator required for exponential and logarithm values.

Keep rate and exposure units consistent. Round only the final result.