Chapter 6 Learning Objectives

Tests are written to evaluate student *comprehension*, *acquisition*, and *synthesis* of these skills. The problems listed in the WA column are the textbook exercises that appear in WebAssign. The problems appearing in the Add’l (Additional) column are good practice problems which are located in the text. The answers to odd-numbered problems are given in the back of the text. The detailed solutions to the odd-numbered problems are also available in the Student Solutions Manual which is available for purchase at the bookstore. Best practices for students preparing for tests include insuring mastery and conceptual understanding of each skill listed below.

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<th>Sec</th>
<th>Learning Objective</th>
<th>WA</th>
<th>Add’l</th>
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| 6.1 | • Evaluate an improper integral numerically (using a calculator);  
• Evaluate an improper integral algebraically;  
• Interpret the value of an improper integral in context (i.e. exponential decay);  
• Determine if an improper integral diverges; and  
• Evaluate an improper integral on the interval $-\infty < x < \infty$. | 7, 11, 14, 19, 21, 23, 25 | 5, 9, 13, 15, 25 |
| 6.2 | • Determine equations for constant, linear and exponential income streams;  
• Calculate the future value;  
• Calculate the amount invested;  
• Calculate the amount of interest;  
• Calculate the present value;  
• Determine the quantity needed to support an income stream in perpetuity; and  
• Interpret the present value and future value of a continuous income stream. | 3, 7, 9, 11, 15, 17, 19 | 13, 17, 19 |
| 6.3 | • Explain the Law of Demand;  
• Given $D(p)$ and $p_0$, determine $q_0$, the quantity at a given price; given $D(p)$ and $q_0$, determine $p_0$, the market price;  
• Given $D(p)$, determine if $p_{max}$ exists, if so, find it;  
• Calculate consumer expenditure, consumer surplus, and consumer willingness and ability to spend for a given $p_0$ or $q_0$;  
• Identify the area that represents the consumer expenditure, consumer surplus, and consumer willingness and ability to spend on the graph of $D(p)$ for a given $p_0$ or $q_0$;  
• Find the point of unit elasticity;  
• Determine if demand is elastic or inelastic at a given price; and  
• Determine the intervals of elasticity and inelasticity given a demand function. | 13, 15, 25, 27, 28 | 19, 23 |
| 6.4 | • Given $S(p)$ and $p_0$, determine $q_0$, the quantity at a given price; given $S(p)$ and $q_0$, determine $p_0$, the market price;  
• Given $S(p)$, determine $p_s$, the shutdown price;  
• Calculate producer revenue, producer surplus, and producer willingness and ability to receive for a given $p_0$ or $q_0$;  
• Identify the area that represents the producer revenue, producer surplus, and produce willingness and ability to receive on the graph of $S(p)$ for a given $p_0$ or $q_0$;  
• Find the point of market equilibrium, $(p^*, q^*)$ and interpret this point; and  
• Find the total social gain at market equilibrium and identify this area on a graph of $D(p)$ and $S(p)$. | 7, 9, 13, 23 | 17, 19, 25 |
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| 6.5     | - Draw a probability histogram with correct widths and heights;  
|         | - Determine probabilities given a probability histogram;  
|         | - State the properties of a probability density function;  
|         | - Verify if a function is a valid probability density function given the equation or graph;  
|         | - Calculate the mean, variance, and standard deviation of a probability density function;  
|         | - Calculate a probability as an area using a geometric formula or an integral; and  
|         | - Interpret a probability. |
| 6.6     | - Determine the equation of a Uniform Density Function and use the function to calculate probabilities;  
|         | - Calculate the mean of a Uniform Density Function;  
|         | - Determine the equation of an Exponential Density Function and use the function to calculate probabilities;  
|         | - Calculate the mean of an Exponential Density Function;  
|         | - Sketch a graph of Uniform, Exponential, and Normal density functions and identify the area that corresponds to a probability of interest;  
|         | - Calculate probabilities on the calculator using the Normal Density Function given the mean and standard deviation (On the calculator: normalcdf(a, b, μ, σ) where the normalcdf function is found by pressing 2nd VARS for DISTRibutions);  
|         | - Calculate probabilities using the Empirical Rule. |

|        | 1, 13, 19, 20, 24, 25, 27, 29 |
|        | 15, 17, 21, 23 |
| 9, 12, 13, 15, 19 | 10, 11, 14, 20 a&b |