Testable Skills – Unit 2

Students should expect test questions that require a synthesis of these skills.

Section 3.3: Rules of Differentiation

Skill	MyLab Math	Textbook
Answer conceptual questions involving rules of differentiation.	4, 5	
Use graphs and tables to find derivatives.	11, 14	
Find derivatives using rules of differentiation.	21, 28, 29, 33, 35	
Solve applications involving rules of differentiation.	44	
Simplify products and quotients to find their derivatives.	47, 49, 51, 57	
Use derivatives to find slope locations and equations of tangent lines.	61, 63	67
Find higher order derivatives of functions.	68, 72	78, 79, 80, 81
Use derivatives to evaluate limits.	82, 85	
Use a calculator to approximate limits. (Review of skill from Section 2.1.)		91
(*Review: Evaluate two-sided limits using limit laws and theorems.)	(2.3.33)	

Section 3.4: The Product and Quotient Rules

Skill	MyLab Math	Textbook
Answer conceptual questions involving the product and quotient rules.	1, 2	
Find derivatives using two different methods.	10, 11, 16	
Find derivatives of products and quotients of functions involving exponentials.	20, 24, 25, 37, 48	
Find derivatives of products and quotients of algebraic expressions.	21, 22, 29, 43, 53	56
Find derivatives using the extended power rule.	39, 41	
Find slopes and equations of tangent lines of functions involving products and quotients.	63, 74, 92	
Solve applications involving the product rule and quotient rule.	65	
Find higher order derivatives of products and quotients.	71, 73	
Find derivatives of products and quotients using given values or graphs.	78, 81	
(*Review: Evaluate limits analytically.)	(2.4.27)	

Section 3.5: Derivatives of Trigonometric Functions

Skill	MyLab Math	Textbook
Answer conceptual questions involving derivatives of trigonometric functions.	1, 8, 54, 72, 31, 78	79
Find limits involving trigonometric functions.	12, 13, 14, 16, 21, 66, 70	
Find derivatives of basic trigonometric functions.	23, 43	
Find derivatives of products, quotients, and powers of functions with trigonometric expressions.	25, 29, 31, 37, 40, 44, 48	50
Solve applications involving derivatives of trigonometric functions.	55	
Find higher order derivatives of functions involving trigonometric functions.	59	
(*Review: Find derivatives of functions using limits.)	(3.2.25)	
(*Review: Evaluate limits at infinity.)	(2.5.17)	
(*Review: Find horizontal and vertical asymptotes of functions.)	(2.5.75)	

Section 3.6: Derivatives as Rates of Change

Skill	MyLab Math	Textbook
Answer conceptual questions involving derivatives as rates of change.	6, 35	
Find functions for velocity and acceleration given position functions.	18, 19	
Solve applications involving position, velocity, and acceleration functions.	25, 36	39, 57
Find average and marginal cost profit functions.	29	31
Solve biological and physical applications involving derivatives as rates of change.	55	
(*Review: Evaluate limits using continuity principles.)	(2.6.51)	

Section 3.7: The Chain Rule

Skill	MyLab Math	Textbook
Answer conceptual questions involving the chain rule.	2, 10, 77	
Identify inner and outer functions for composite functions, then apply the chain rule.	17, 20, 23	
Find derivatives of functions involving the chain rule by using tables and graphs.	25	
Find derivatives of basic functions using the chain rule.	27, 29, 32, 33, 35, 37, 42, 44, 48, 75	
Use the chain rule multiple times and use the chain rule with the product and quotient rules.	40, 41, 49, 59, 63, 66, 70, 73	
Find higher order derivatives using the chain rule.	86, 89	
Find slopes of curves and equations of tangent lines by using the chain rule.	93, 95	
Solve applications involving the chain rule.		98
(*Review: Find derivatives of products and quotients of algebraic expressions.)	(3.4.19)	
(*Review: Find derivatives of products and quotients of functions involving exponentials.)	(3.4.27)	

Section 3.8: Implicit Differentiation

Skill	MyLab Math	Textbook
Answer conceptual questions involving implicit differentiation.	1	
Find derivatives using implicit differentiation.	5, 27	
Find second derivatives using implicit differentiation.	11, 55	
Use implicit differentiation to find slopes of curves at given points.	13, 17, 18, 25	
Use implicit differentiation along with the product, quotient, and chain rules to find derivatives.	31, 32, 34, 39	
Solve applications using implicit differentiation.	42	41
Answer questions involving tangent lines using implicit differentiation.	46, 50, 61, 63, 65	
Find normal lines using implicit differentiation.	78	73
(*Review: Find derivatives of products, quotients, and powers of functions with trigonometric expressions.)	(3.5.41)	

Section 3.9: Derivatives of Logarithmic and Exponential Functions

Skill	MyLab Math	Textbook
Answer conceptual questions involving derivatives of logarithmic and exponential functions.	3, 5, 109	
Find derivatives involving logarithms and exponentials.	16, 19, 23, 27, 29, 34, 36, 37, 40, 47, 53, 64	
Find equations of tangent lines for exponential, logarithmic, and power functions.	59	
Find derivatives using logarithmic differentiation.	77, 79, 85, 92	
Find higher order derivatives of functions involving logarithms and exponentials.	91	
Evaluate limits of logarithmic and exponential functions using the definition of the derivative.	105	
(*Review: Find derivatives of functions using limits.)	(3.2.37)	
(*Review: Evaluate two-sided limits using limit laws and theorems.)	(2.3.25)	

Section 3.10: Derivatives of Inverse Trigonometric Functions

Skill	MyLab Math	Textbook
Answer conceptual questions involving derivatives of inverse trigonometric functions.	1	89
Find slopes and equations of tangent lines of inverse trigonometric functions.	3, 42	
Find derivatives of functions involving inverse trigonometric functions.	13, 15, 18, 21, 30, 31, 33, 62	
Solve applications involving derivatives of inverse functions.	81	45
(*Review: Find derivatives of basic functions using the chain rule.)	(3.7.46)	
(*Review: Evaluate limits analytically.)	(2.4.35)	
(*Review: Use the chain rule multiple times and use the chain rule with the product and quotient rules.)	(3.7.55)	

Section 3.11: Related Rates

Skill	MyLab Math	Textbook
Answer conceptual questions involving related rates.	3	9, 10
Solve related rates problems involving geometry.	11, 13, 15, 17	
Solve applications involving related rates.	19, 25, 29, 33, 35, 39, 41, 43, 50	22, 47, 51
(*Review: Find derivatives of products and quotients of algebraic expressions.)	(3.4.53)	
(*Review: Find derivatives of products and quotients of functions involving exponentials.)	(3.4.24)	
(*Review: Use implicit differentiation along with the product, quotient, and chain rules to find derivatives.)	(3.8.33)	
(*Review: Find horizontal and vertical asymptotes of functions. *Review*)	(2.5.47)	

Section 4.1: Maxima and Minima

Skill	MyLab Math	Textbook
Answer conceptual questions involving maxima and minima.	5, 9, 77, 78, 89	
Use a graph to identify absolute and/or local extrema.	11, 14, 15, 17	85
Sketch the graph of a function on an interval satisfying given properties.	19	
Locate critical points of functions.	23, 31, 33, 35, 41	
Determine the existence, location, and value of absolute extrema on a given interval of a function.	43, 49, 52, 53, 55, 63, 65	
Solve applications involving maxima and minima.	75	87
(*Review: Find points of discontinuity or intervals of continuity.)	(2.6.30)	
(*Review: Evaluate limits using continuity principles.)	(2.6.63)	
(*Review: Find derivatives involving logarithms and exponentials.)	(3.9.30)	
(*Review: Find derivatives of products, quotients, and powers of functions with trigonometric expressions.)	(3.5.37)	

Section 4.2: Mean Value Theorem

Skill	MyLab Math	Textbook
Answer conceptual questions involving Rolle's Theorem and the Mean Value Theorem.	3, 8, 33	5, 6, 7
Determine if Rolle's Theorem applies and find the point(s) guaranteed to exist by Rolle's Theorem.	11, 15, 18	
Find the point(s) guaranteed to exist by the Mean Value Theorem.	21, 25, 26, 29	
Find functions with the same derivative of a given function.	36, 37, 49	
Use graphs to answer questions involving the Mean Value Theorem.	39	
Solve applications involving the Mean Value Theorem.	50	