Course: AP Calculus AB

Text: Calculus: Graphical, Numerical, Algebraic Authors: Finney, Demana, Waits, Kennedy Copyright: 2003

Day	Торіс	Assignment	Comments
1	Lines:	1.1: 3 – 36 m3, 37, 39, 43, 49	
	• Increments		
	• Slope of a line		
	• Parallel and perpendicular lines		
	• Equations of lines,		
	Applications		
2	Functions and Graphs:	1.2a: 3 – 33 m3, 35, 36, 39	
	• Functions		
	 Domains and ranges 		
	• Viewing and interpreting graphs		
	• Even and odd functions – symmetry		
3	Functions and Graphs:	1.2b: 42, 45, 49, 53, 57, 63, 65, 66	
	 Functions defined in pieces 		
	Absolute value function		
	Composite functions		
4	Exponential Functions	1.3: 3 – 21 m3, 22, 24 – 29, 34, 38	
	Exponential Growth		
	• Exponential decay		
	Applications		
	• The number <i>e</i>		
5	Parametric Equations:	1.4a: <i>Exploration 1,2</i>	Quiz 1.1 -
	• Relations		1.3
	• Circles		
	• Ellipses		
6	Parametric Equations:	1.4b: $3, 6, 7 - 27 \text{ odd}, 30, 42$	
	Lines and other curves	1 5 0 40 0 40 50	
	Functions and Logarithms:	1.5: $3 - 42 \text{ m}3, 43, 48, 50$	
	• One – to – one Functions		
	• Inverses		
	• Finding Inverses		
	Logarithmic Functions		
	• Properties of Logarithms		
	• Applications		
8	Padian Massure	1.0a: Exploration 1, 2	
	 Kadian Measure Currely of This and the first second s		
	Graphs of Trigonometric Functions Derived inity		
	 Ferrodicity Even and Odd Trigon on strip Even time 		
	• Even and Odd Irigonometric Functions		

	• Transformations of Trigonometric graphs		
	Applications		
9	Trigonometric Functions:	1.6b: 2 – 34 even, 38, 45	
	Inverse Trigonometric Functions		
10	Review worksheet	Review worksheet	Quiz 1.4 -
	Quiz 1.4 - 1.6		1.6
11	Go over review	Go over review	
12	Unit 1 Test	Unit 1 test	
13	Rates of Change and Limits:	2.1a: 9 – 30 m3	
	• Average and Instantaneous Speed		
	Definition of Limit		
	Properties of Limits		
14	Rates of Change and Limits:	2.1b: 3, 6, 32, 35, 39, 42, 44, 45, 48, 49,	
	• One – sided and Two – sided Limits	55, 58	
	Sandwich Theorem		
15	Limits Involving Infinity:	2.2a: 3 – 27 m3 and <i>Exploration 1</i>	
	• Finite Limits as x Approaches <u>+</u> Infinity	_	
	Sandwich Theorem Revisited		
16	Limits Involving Infinity:	2.2b: 30 – 48 m3, 54, 57, 59	
	• Infinite Limits as x approaches a		
	End Behavior Models		
	• "Seeing" Limits as x Approaches +		
	Infinity		
17	Quiz 2.1 – 2.2		
18	Continuity:	2.3a: pg. 70 <i>Exploration 1</i> , pg. 80: 2 – 20	
	Continuity at a Point	even	
19	Continuity:	2.3b: 22 – 30 even, 36, 39, 42, 43, 48	
	Continuous Functions		
	Algebraic Combinations		
	Composites		
	Intermediate Value Theorem for		
	Continuous Functions		
20	Rates of Change and Tangent Lines:	2.4a: 1 - 8	
	• Average Rates of Change		
	• Tangent to a Curve		
	• Slope of a Curve		
21	Rates of Change and Tangent Lines:	2.4b: 9 – 33 odd, 30, 41	
	• Normal to a Curve		
	• Speed revisited		
22	Review worksheet and pg. 92: 29, 41, 42	Review worksheet and pg. 92: 29, 41, 42	Quiz 2.3,
	Quiz 2.3, 2.4		2.4
23	Go over review	Go over review	
24	Test Unit 2	Test Unit 2	

25	Derivative of a Function:	3.1a: 1–6	
	• Definition of a Derivative		
	Notation		
	• Relationships between the graphs of f and		
	f'		
26	Derivative of a Function:	3.1b: 7 – 10, 11 – 17 odd <i>Exploration 1</i>	
	• Graphing the derivative from data.	page 98	
27	Derivative of a Function:	3.1c: 19 – 25 odd, 16, 18, 26	
	One – sided derivatives		
28	Differentiability:	3.2a: 1 – 10 & <i>Exploration 1</i> pg. 107	
	• How f'(a) might fail to exist		
29	Differentiability:	3.2b: 11 – 17 odd, 18 – 22, 29, 31	
	• Differentiability implies local linearity		
	• Derivatives on a calculator		
	• Differentiability implies continuity		
	• Intermediate value theorem for		
	derivatives		
30	Rules for Differentiation:	3.3a: 1 – 10, 25, 27	
	 Positive integer powers, multiples, sums, 		
	and differences		
31	Rules for Differentiation:	3.3b: 11 – 21, 23	
	Products and quotients		
32	Rules for Differentiation:	3.3c: 28 – 34	
	 Negative integer powers of x 		
	Second and higher order derivatives		
33	Quiz 3.1 – 3.3		
34	Velocity and Other Rates of Change:	3.4a: 1, 2, 13, 14, 16, 21 (individually), 23	
	 Instantaneous rates of change 		
	Motion along a line		
35	Velocity and Other Rates of Change:	3.4b: 4, 5, 24, 29, 31, 33, <i>Exploration 2</i>	
	Motion along a line continued	pg. 127	
36	Velocity and Other Rates of Change:	3.4c: 10, 25, 27 (individually), 30, 36,	
	Sensitivity to change	Exploration 3 pg. 127	
37	Derivatives of Trigonometric Functions:	3.5a: 1, 3, 5, 7, 8, 10, 14	
	• Derivative of the sine function		
	• Derivative of the cosine function		
	Simple harmonic motion		
38	Derivatives of Trigonometric Functions:	3.5b: 2, 4, 6, 9, 12, 18	
	• Jerk		
39	Derivatives of Trigonometric Functions:	3.5c: 16, 20, 25 (a, b), 27, 29, 31, 33	Quiz:
	• Derivatives of the other basic		Matching
	trigonometric functions		graphs
40	Chain Rule:	3.6a: 3 - 33 multiples of 3	
	• Derivatives of a composite function		

41 Chain Rule:	3.6b: 36 - 63 multiples of 3	
• "Outside – Inside" rule		
• Repeated use of the chain rule		
• Slopes of parametrized curves.		
42 Chain Rule:	3.6c: 50, 61, 64, 66, 69	
• Power chain rule		
43 Quiz: 3.4 – 3.6		
44 Implicit Differentiation:	3.7a: 9, 12, 18, 27, 30,33, 36, 39,41	Derivative
• Implicitly defined functions		Quiz
• Lenses, tangents, and normal lines		
45 Implicit Differentiation:	3.7b: 3, 6, 15, 21, 24, 42, 45, 46	
• Derivatives of higher order		
• Rational powers of differentiable		
functions		
46 Derivatives of Inverse Trig. Functions	3.8a: 3, 4, 5, 10, 17, 22, 23, 27	
• Derivatives of inverse functions		
• Derivatives of the Arcsine		
• Derivative of the Arctangent		
47 Derivatives of Inverse Trig. Functions	3.8b: 1, 7, 9, 11, 13, 15, 21, 24, 30	
• Derivative of the Arcsecant		
• Derivatives of the other three		
48 Derivatives of Exponential and	3.9a: <i>Exploration 1</i> page 166 & Pg. 170 -	Derivative
Logarithmic Functions	171: 1 - 9 odd, 15 - 18	Ouiz
• Derivative of e^x	,	
• Derivative of a^x		
49 Derivatives of Exponential and	3.9b: 21 - 39 odd	
Logarithmic Functions		
• Derivative of ln x		
 Derivative of log₂x 		
50 Derivatives of Exponential and	3.9c: 11, 13, 19, 41, 47 - 50	
Logarithmic Functions		
• Power rule for arbitrary real powers		
51 AP Review	pg. 173 – 174: 59-63	Derivative
	r 8	Ouiz
52 AP Review	pg. 173 – 174: 64 - 67, 70, 78	Quiz: 3.7 –
Quiz: 3.7 – 3.9		3.9
53 Test Review Worksheet	Test Review Worksheet	
54 Go over review	Go over review	
55 Test Unit 3	Test	
56 Extreme Values of Functions	4.1a: 1 - 10	
• Absolute (Global) extreme values		
57 Extreme Values of Functions	4.1b and c: 11 - 26	Derivative
• Local (Relative) extreme values		Quiz
• Finding extreme values		

58	Extreme Values of Functions	4.1d: 27 – 30, 35, 36, 37, 39	
	• Absolute (Global) extreme values		
	• Local (Relative) extreme values		
	• Finding extreme values		
59	Extreme Values of Functions	4.1e: 41, 43, 45 – 49; <i>Exploration 1</i> pg.	Derivative
	• Absolute (Global) extreme values	183	Quiz
	• Local (Relative) extreme values		
	• Finding extreme values		
60	Mean Value Theorem	4.2a: 15, 18, 21, 24, 39, 42, 48, 52	
	Mean value theorem		
	Physical interpretation		
61	Mean Value Theorem	4.2b: 3, 6, 9, 12, 27, 30, 33, 43, 45	
	• Increasing and decreasing functions		
	• Other consequences		
62	Connecting f' and f" with the graph of f	4.3a: 3 – 6, 37, 40, 43, 45	
	• First derivative test for local extrema		
63	Connecting f' and f" with the graph of f	4.3b: 1, 29, 33, 34, 41, 42, 44	
	Concavity		
	• Second derivative test for local extrema		
64	Connecting f' and f" with the graph of f	4.3c: pg. 204: 7 – 25 m3, 46, 48, 49	
	• Learning about functions from derivatives		
65	Quiz: 4.1 – 4.3		
66	Modeling and Optmization	4.4a: 9, 17, 19	
	• Examples from business and industry		
67	Modeling and Optmization	4.4b: 1, 5, 8	
	• Examples from mathematics		
68	Modeling and Optmization	4.4c: <u>Day 1</u> : pg. 215 - 217: 12, 20, 31,	
	• Examples from economics	36	
69	Modeling and Optmization	4.4d: Day 2 : pg. 215 – 217: 35, 38, 49, 51,	Volume
	• Examples from business and industry	52	Lab
	• Examples from mathematics		
	• Examples from economics		
70	Linearization and Newton's Method	4.5a: pg. 229: 3, 5 – 7, 9, 11, 14, 15	
	Linear approximation	pg. 220: Exploration 1	
	• Newton's method		
71	Linearization and Newton's Method	4.5b: 8, 18, 19, 22, 25, 33, 36	
	• Differentials		
	• Estimating change with differentials		
72	Linearization and Newton's Method	4.5c: 27, 30, 37, 39, 44, 46, 50, 51	
	• Absolute, relative, and percentage change		
	Sensitivity to change		
73	Related rates	4.6a: 3, 9, 12, 18, 23	
	Related rate equations		
	• Solution strategy		

74	Related rates	4.6b: 6, 13, 15, 21, 22	
	• Solution strategy		
	Simulating elated motion		
75	Quiz: 4.4 – 4.6		
76	AP Review	pg. 238 – 239: 24, 27, 30, 33, 36, 39, 40	
77	Review ws	Review ws	
78	Go over review ws	Go over review ws	
79	Unit 4 Test	Unit 4 Test	
80	Exam Review		
81	Exam Review		
82	Exam Review		
83	Exam		
84	Estimating with Finite Sums	5.1 a: 1 – 4, 6, 9, 12 & Pg. 251:	
	• Distance traveled	Exploration 1	
	Rectangular approximation method		
85	Estimating with Finite Sums	5.1b: 14, 15, 18, 20, 21, 24, 26	
	• Volume of a sphere		
	Cardiac output		
86	Definite Integrals	5.2a: 1 – 6, 13 – 27 odd	
	• Riemann sums		
	• Terminology and notation of integration		
	• Definite integral and area		
87	Definite Integrals	5.2b: 7 – 11 odd, 39, 41, 43 – 47	
	Constant Functions		
	• Integrals on a calculator		
	Discontinuous integrable functions		
88	Definite Integrals and Antiderivatives	5.3a: 1 – 6, 35, 36	
	• Properties of definite integrals		
89	Definite Integrals and Antiderivatives	5.3b and c: pg. 275: 9 – 27 m3, 32 – 35,	
	• Average value of a function	40	
	• Mean value theorem for definite integrals		
	• Connecting differential and integral		
	calculus		
91	Quiz 5.1 – 5.3		
92	Fundamental Theorem of Calculus	5.4a: 37, 39, 41 - 48	
	• Fundamental theorem part 1		
93	Fundamental Theorem of Calculus	5.4 b and c: Pg. 286: 1 – 13 odd, 19 – 24	
	• Graphing the function [integral of F(t) dt]	(1 – 8 graphically also)	
	• Fundamental theorem part 2		
95	Fundamental Theorem of Calculus	5.4d and e: 15 – 17, 25 – 33 odd, 52, 53 –	
	Area connection	59 odd	
	• Applications of the fundamental		
	theorem		
97	Trapezoidal Rule	5.5a: 1 - 9	

	Trapezoidal approximations		
98	Trapezoidal Rule	5.5b: Program ws Trap and Simpson Rule	In IT
	• Simpson's rule		
99	Trapezoidal Rule	5.5c: Pg. 296 - 297: 10, 11, 13, 16 - 19, 23	
	• Error analysis		
100	Unit 5 Review	Unit 5 Review ws	
101	Unit 5 Review	Check Review	
102	Unit 5 Test	Unit 5 Test	
103	Antiderivatives and Slope Fields	6.1a: Slope Field Program	
	• Solving initial value problems		
104	Antiderivatives and Slope Fields	6.1b: 3 – 24 m3, 25	
	• Antiderivatives and indefinite integrals		
	• Properties of indefinite integrals		
105	Antiderivatives and Slope Fields	6.1c: 27 – 51 m3	Integral
	• Applications of antiderivatives		Quiz
106	Integration by Substitution	6.2a: 1 – 15	
	• Power rule in integral form		
	Trigonometric integtrands		
107	Integration by Substitution	6.2b: 17, 18 – 36 m3 <i>Exploration 2</i> pg.	
	• Substitution in indefinite integrals	320	
	Substitution in definite integrals		
108	Integration by Substitution	6.2c: 39 – 44, 49	
	Separable differential equations		
109	Exponential Growth and Decay	6.4a: 1 – 9 odd, 12, 14, 15	Integral
	• Law of exponential change		Quiz
	Continuously compounded interest		
	Radioactivity		
110	Exponential Growth and Decay	6.4b: 17 – 22	
	Newton's law of cooling		
111	Newton's Law of Cooling	Activity	
112	Exponential Growth and Decay	$6.4c: \ 24 - 27, \ 30, \ 33, \ 34$	
110	Resistance proportional to velocity		
113		Quiz: $6.1 - 6.4$	
114	Population Growth	6.5a: 1-4, 5-11 odd	
	• Exponential model		
115	Logistic growth model	(5) 12 20 11	
115	Population Growth	6.5b: $13 - 29$ odd	
116	Logistic regression	6 6 or 2 4 6 9 and program EULEDT and	
110	Fuller's method	0.0a.2 - 4, 0 - 8 and program EULEKT and EULEKT and	
	Euler's method Numerical Solutions		
	Inumerical solutions Crephical solutions		
117	Graphical solutions	6.6h. 0.12.15.16 and program MDELUT	
11/	Euler's method	and IMPEULI G	
1			1

	Numerical Solutions	
	Graphical solutions	
118	Numerical Methods	6.6c: 17, 19, 22, 24, 25, 28
	Improved Euler's method	
119	Unit 6 Review ws	Unit 6 Review ws
120	Go over Unit 6 Review	Go over Unit 6 Review
121	Unit 6 Test	Unit 6 Test
122	Integral as Net Change	7.1a: pg. 365: <i>Exploration 1</i> , Pg. 371: 1–
	Linear motion revisited	8
123	Integral as Net Change	7.1b: 9 – 16
	General strategy	
124	Integral as Net Change	7.1c: 17, 20 – 22, 24 – 27, 29, 31
	Consumption over time	
	• Net change from data	
	• Work	
125	Areas in the Plane	7.2a: 1, 2, 5, 6, 11, 13, 14
	Area between curves	
	Area enclosed by intersecting curves	
126	Areas in the Plane	7.2b: 3, 7, 9, 15 – 25 odd
	Boundaries with changing functions	
	• Integrating with respect to y	
127	Areas in the Plane	7.2c: 27, 29, 33, 36, 40, 42, 43, 46
	• Saving time with geometry formulas	
128	Volumes	7.3a: pg. 387: <i>Exploration 1</i> and pg. 390
	• Volume as an integral	- 391: 3, 5
	Square cross sections	
	Circular cross sections	
129	Volumes	7.3b: 1, 4, 6, 7, 8, 9
	Other cross sections	
130	Volumes	7.3c: $11 - 25$ odd, 28, 29
	• Volume as an integral	
	• Square cross sections	
	Circular cross sections	
	Other cross sections	
131	Volumes	7.3d: 33, 39, 42, 44, 49, 53, 57, 60, 63
	• Volume as an integral	
	Square cross sections	
	Circular cross sections	
	Other cross sections	
132	Lengths of Curves	
	• A sine wave	
	Length of a smooth curve	
133	Lengths of Curves	
	• Vertical tangents, corners, and cusps	

134	Applications from Science and Statistics	7.5a: 1, 3, 5, 6, 8
	Work revisited	
135		Quiz: 7.1 – 7.3
136	Applications from Science and Statistics	7.5b: 10, 12, 17, 21, 24
	• Fluid force and pressure	
137	Applications from Science and Statistics	7.5c: 25 – 29
	Normal probabilities	
138	Applications from Science and Statistics	7.5d: 30, 31, 33, 35, 37, 39
	Work revisited	
	• Fluid force and pressure	
	Normal probabilities	
139 -		AP Review 12 days minimum
151		
151 - ?	6.3 – Integration by parts	
	Finish Chapter 7	
	Begin Chapter 8	
	Improper Integrals	
	Partial Fractions	