

# AP Calculus BC Independent Study Curriculum

(for students who took AP Calculus AB)

Cribsheets	Stewart (4 <sup>th</sup> ed.) and College Board
<b>Additional integration techniques</b>	
3.6 Integration by parts	p. 508 # 3, <b>4</b> , 7, <b>8</b> , 29, <b>30</b> L1. Evaluate $\int \ln x \, dx$
3.7 Partial fractions and introduction to logistic growth	p. 532 # 13, 15, <b>16</b> , 17, <b>20</b> Word problem: p. 533 # 65
3.8 Improper integrals	p. 565 # <b>16</b> , 21, 33, <b>34</b>
3.9 Euler method	$\frac{dy}{dx} = \frac{y}{1+x^2}$ , $(x, y) = (3, 2)$ , $x_f = 5.0$ , $\Delta x = 0.5$ , $y_f = ?$
<b>Calculus of geometric curves</b>	
4.5 Parametric	Eliminate parameter: p. 679 # <b>1</b> , <b>7</b> , 9 Slope: p. 687 # 13, <b>14</b> , 15, 17 Area: p. 688 # 33, <b>34</b> , 35
4.6 Arc lengths and surfaces of revolution	Arc length: p. 693 # 1, <b>2</b> ; 5, <b>6</b> , 7 Surface area: p. 693 # 23, <b>24</b> , 25; 29, <b>30</b> , 31
4.7 Polar calculus	Review of polar coordinates p. 702 # <b>18</b> , 19; 25, <b>26</b> ; 69 Slope: p. 703 # 57, 59, <b>60</b> ; 65, <b>66</b> , 67 Area: p. 708 # 1, <b>2</b> , 3; 5, <b>6</b> ; 17, <b>18</b> ; <b>26</b> , 27; 33, <b>34</b> Arc length: p. 708 # 45, <b>46</b> , 47, 49; 53, <b>54</b>
<b>Calculus of sequences and series</b>	
5.1 Series, tests, and remainders	Recognizing and expressing sequences p. 736 # 9, <b>10</b> , 11, 12, 13, <b>14</b> ; Assess convergence of sequences (introductory) p. 736 # <b>16</b> , 17, <b>26</b> , 27, <b>30</b> Recognizing and expressing series p. 745 # <b>5</b> , 7, <b>10</b> Assessing convergence of series (introductory) p. 745 # 11, 12, <b>14</b> , 15, 17, <b>24</b> , 25, 27, 33; 35, <b>36</b> p. 746 # 41, <b>42</b> , 43, 45 Integral test p. 754 # 3, <b>4</b> , 5, 6, 7, <b>8</b> , 11, <b>12</b> , <b>14</b> , 19, 21, <b>24</b> Comparison tests p. 759 # <b>10</b> , <b>13</b> , 14, 29 Alternating series p. 765 # 3, <b>6</b> , 7, <b>10</b> , 29, <b>30</b> , <b>32</b> Absolute convergence, ratio test, root test p. 770 # 11, <b>12</b> , 18, <b>20</b> , 21, <b>22</b> , 23 Calculus instructors have flowcharts Read p. 772 12.7; [Additional practice: p. 773 # all] Power series p. 783 # 3, <b>4</b> , <b>30</b>
5.2 Common Taylor series	Choose one of the power series on the cribsheet to derive
5.3.1 Recognizing sums	Need to be able to recognize types of series when they have been disguised: Review types of series from cribsheet of series/tests; plug in simple numbers (e.g. 1) for various parameters (e.g. $a = 1$ ) and pay attention to the appearance of the resulting special case series.
5.4.2 Obtaining series representations using differentiation and/or integration	(Lecture with pauses for handwritten copying of work in cribsheet) p. 795 # 41, <b>42</b> , <b>46</b> , 47; FRQ 2006 (B) # <b>6</b>