Welcome to

AP Calculus AB

2019-2020

Welcome to Advanced Placement (AP) Calculus AB! This September you will begin your study of almost a full year of college-level calculus with the widely respected AP curriculum. This course is **very CHALLENGING and DEMANDING**, and you will consistently be expected to perform at a high level of mathematical understanding.

Prerequisites for Calculus Success:

A successful AP Calculus student has …

- a *VERY strong* understanding of precalculus concepts

- EXCELLENT algebra skills

- working knowledge of a TI-84 Plus graphing calculator
                    (This calculator is *required EVERY day* in this class.)

- MOTIVATION, self-discipline, resilience, and perseverance, especially when the problems or concepts get difficult

- ability and willingness to think creatively and "outside the box"

- TIME availability (approximately 1 hour daily)

About the Summer Assignment:

In order to have adequate review time for the AP exam in May, we must finish the AP curriculum by April 1. Due to the large number of topics in the AP curriculum, *we can NOT go back and review any precalculus* concepts. This summer assignment is designed to help you review the precalculus concepts necessary for success in AP Calculus.

During the summer you will be expected to complete the REQUIRED summer assignment (see reverse.) You will have one full class period to ask questions about the assignment. **You will be tested on this material during the first week of classes.**

ASSIGNMENT:

Textbook: Calculus: Graphical, Numerical, and Algebraic, 5th Edition (Pearson)
Authors: Finney, Demana, Waits, Kennedy, Bressoud
Your textbook is available for purhcase on www.mbsdirect.net.

ALL problems should be completed WITHOUT a calculator:
> *Do*:   1.1 Exercises #6, 9, 12, 19-32 (multiples of 3), 41, 48, 55
> 1.2 Exercises #3-33 (multiples of 3), 37-40, 42, 45, 49, 51, 53
> 1.3 Exercises #1-18 odds, 22-27, 32
> 1.5 Exercises #3-24 (multiples of 3), 33-42 (multiples of 3), 48,
> 1.6 Exercises #1-22 odds, 27-42 odds
> Chapter 1 Review Exercises #1-44 evens, 53-64 evens
> Algebra that Occurs in Calculus Worksheet (attached)

This assignment is DUE on the first day of classes (Friday, September 6.)

TO PURCHASE YOUR BOOK:
1. Go to www.mbsdirect.net and purchase an access code.
2. Go to www.mymathlab.com to register for Calculus using course ID: **curley67315**

If you have any problems, contact Mr. Curley at pcurley@awhs.org.
To access your book on your iPad, go to the App Store and download the Pearson eText app, which looks like:

Algebra That Occurs in Calculus Problems

In Problems 35–42, expressions that occur in calculus are given. Reduce each expression to lowest terms.

35. $\dfrac{(2x + 3)\cdot 3 - (3x - 5)\cdot 2}{(3x - 5)^2}$

36. $\dfrac{(4x + 1)\cdot 5 - (5x - 2)\cdot 4}{(5x - 2)^2}$

37. $\dfrac{x\cdot 2x - (x^2 + 1)\cdot 1}{(x^2 + 1)^2}$

38. $\dfrac{x\cdot 2x - (x^2 - 4)\cdot 1}{(x^2 - 4)^2}$

39. $\dfrac{(3x + 1)\cdot 2x - x^2\cdot 3}{(3x + 1)^2}$

40. $\dfrac{(2x - 5)\cdot 3x^2 - x^3\cdot 2}{(2x - 5)^2}$

41. $\dfrac{(x^2 + 1)\cdot 3 - (3x + 4)\cdot 2x}{(x^2 + 1)^2}$

42. $\dfrac{(x^2 + 9)\cdot 2 - (2x - 5)\cdot 2x}{(x^2 + 9)^2}$

In Problems 121–130, expressions that occur in calculus are given. Factor completely each expression.

121. $2(3x + 4)^2 + (2x + 3)\cdot 2(3x + 4)\cdot 3$

122. $5(2x + 1)^2 + (5x - 6)\cdot 2(2x + 1)\cdot 2$

123. $2x(2x + 5) + x^2\cdot 2$

124. $3x^2(8x - 3) + x^3\cdot 8$

125. $2(x + 3)(x - 2)^3 + (x + 3)^2\cdot 3(x - 2)^2$

126. $4(x + 5)^3(x - 1)^2 + (x + 5)^4\cdot 2(x - 1)$

127. $(4x - 3)^2 + x\cdot 2(4x - 3)\cdot 4$

128. $3x^2(3x + 4)^2 + x^3\cdot 2(3x + 4)\cdot 3$

129. $2(3x - 5)\cdot 3(2x + 1)^3 + (3x - 5)^2\cdot 3(2x + 1)^2\cdot 2$

130. $3(4x + 5)^2\cdot 4(5x + 1)^2 + (4x + 5)^3\cdot 2(5x + 1)\cdot 5$

In Problems 59–70, simplify each expression.

59. $8^{2/3}$

60. $4^{3/2}$

61. $(-27)^{1/3}$

62. $16^{3/4}$

63. $16^{3/2}$

64. $25^{3/2}$

65. $9^{-3/2}$

66. $16^{-3/2}$

67. $\left(\dfrac{9}{8}\right)^{3/2}$

68. $\left(\dfrac{27}{8}\right)^{2/3}$

69. $\left(\dfrac{8}{9}\right)^{-3/2}$

70. $\left(\dfrac{8}{27}\right)^{-2/3}$

In Problems 71–78, simplify each expression. Express your answer so that only positive exponents occur. Assume that the variables are positive.

71. $x^{3/4}x^{1/3}x^{-1/2}$

72. $x^{2/3}x^{1/2}x^{-1/4}$

73. $(x^3 y^6)^{1/3}$

74. $(x^4 y^8)^{3/4}$

75. $\dfrac{(x^2 y)^{1/3}(x y^2)^{2/3}}{x^{2/3} y^{2/3}}$

76. $\dfrac{(xy)^{1/4}(x^2 \dot{y}^2)^{1/2}}{(x^2 y)^{3/4}}$

77. $\dfrac{(16x^2 y^{-1/3})^{3/4}}{(x y^2)^{1/4}}$

78. $\dfrac{(4x^{-1} y^{1/3})^{3/2}}{(xy)^{3/2}}$

In Problems 87–100, expressions that occur in calculus are given. Write each expression as a single quotient in which only positive exponents and/or radicals appear.

87. $\dfrac{x}{(1+x)^{1/2}} + 2(1+x)^{1/2}$ $x > -1$

88. $\dfrac{1+x}{2x^{1/2}} + x^{1/2}$ $x > 0$

89. $2x(x^2+1)^{1/2} + x^2 \cdot \dfrac{1}{2}(x^2+1)^{-1/2} \cdot 2x$

90. $(x+1)^{1/3} + x \cdot \dfrac{1}{3}(x+1)^{-2/3}$ $x \neq -1$

91. $\sqrt{4x+3} \cdot \dfrac{1}{2\sqrt{x-5}} + \sqrt{x-5} \cdot \dfrac{1}{5\sqrt{4x+3}}$ $x > 5$

92. $\dfrac{\sqrt[3]{8x+1}}{3\sqrt[3]{(x-2)^2}} + \dfrac{\sqrt[3]{x-2}}{24\sqrt[3]{(8x+1)^2}}$ $x \neq 2,\ x \neq -\dfrac{1}{8}$

93. $\dfrac{\sqrt{1+x} - x \cdot \dfrac{1}{2\sqrt{1+x}}}{1+x}$ $x > -1$

94. $\dfrac{\sqrt{x^2+1} - x \cdot \dfrac{2x}{2\sqrt{x^2+1}}}{x^2+1}$

95. $\dfrac{(x+4)^{1/2} - 2x(x+4)^{-1/2}}{x+4}$ $x > -4$

96. $\dfrac{(9-x^2)^{1/2} + x^2(9-x^2)^{-1/2}}{9-x^2}$ $-3 < x < 3$

97. $\dfrac{\dfrac{x^2}{(x^2-1)^{1/2}} - (x^2-1)^{1/2}}{x^2}$ $x < -1$ or $x > 1$

98. $\dfrac{(x^2+4)^{1/2} - x^2(x^2+4)^{-1/2}}{x^2+4}$

99. $\dfrac{\dfrac{1+x^2}{2\sqrt{x}} - 2x\sqrt{x}}{(1+x^2)^2}$ $x > 0$

100. $\dfrac{2x(1-x^2)^{1/3} + \dfrac{2}{3}x^3(1-x^2)^{-2/3}}{(1-x^2)^{2/3}}$ $x \neq -1, x \neq 1$

In Problems 101–110, expressions that occur in calculus are given. Factor each expression. Express your answer so that only positive exponents occur.

101. $(x+1)^{3/2} + x \cdot \dfrac{3}{2}(x+1)^{1/2}$ $x \geq -1$

102. $(x^2+4)^{4/3} + x \cdot \dfrac{4}{3}(x^2+4)^{1/3} \cdot 2x$

103. $6x^{1/2}(x^2+x) - 8x^{3/2} - 8x^{1/2}$ $x \geq 0$

104. $6x^{1/2}(2x+3) + x^{3/2} \cdot 8$ $x \geq 0$

105. $3(x^2+4)^{4/3} + x \cdot 4(x^2+4)^{1/3} \cdot 2x$

106. $2x(3x+4)^{4/3} + x^2 \cdot 4(3x+4)^{1/3}$

107. $4(3x+5)^{1/3}(2x+3)^{3/2} + 3(3x+5)^{4/3}(2x+3)^{1/2}$ $x \geq -\dfrac{3}{2}$

108. $6(6x+1)^{1/3}(4x-3)^{3/2} + 6(6x+1)^{4/3}(4x-3)^{1/2}$ $x \geq \dfrac{3}{4}$

109. $3x^{-1/2} + \dfrac{3}{2}x^{1/2}$ $x > 0$

110. $8x^{1/3} - 4x^{-2/3}$ $x \neq 0$