Uncommon **Schools** | Change History.

AP Calculus AB

Q1 Interim Assessment

Test Booklet 2

Multiple Choice - Calculator

October 2016

School: _____

Student Name: _____

Teacher: _____

Period: _____

AP® Calculus AB Exam

SECTION I: Multiple Choice

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

At a Glance

Total Time
1 hour, 45 minutes
Number of Questions
45
Percent of Total Score
50%
Writing Instrument
Pencil required

Part A

Number of Questions
30
Time
60 minutes
Electronic Device
None allowed

Part B

Number of Questions
15
Time
45 minutes
Electronic Device
Graphing calculator
required

Instructions

Section I of this exam contains 45 multiple-choice questions. For Part A, fill in only the boxes for numbers 1 through 30 on the answer sheet. For Part B, fill in only the boxes for numbers 76 through 90 on the answer sheet.

Indicate all of your answers to the multiple-choice questions on the answer sheet. No credit will be given for anything written in this exam booklet, but you may use the booklet for notes or scratch work. After you have decided which of the suggested answers is best, place the letter of your choice in the corresponding box on the answer sheet. Give only one answer to each question.

Use your time effectively, working as quickly as you can without losing accuracy. Do not spend too much time on any one question. Go on to other questions and come back to the ones you have not answered if you have time. It is not expected that everyone will know the answers to all of the multiple-choice questions.

Your total score on the multiple-choice section is based only on the number of questions answered correctly. Points are not deducted for incorrect answers or unanswered questions.

CALCULUS AB

SECTION I, PART B

Time – 45 minutes

Number of questions – 15

A GRAPHING CALCULATOR IS REQUIRED FOR SOME QUESTIONS ON THIS PART OF THE EXAM.

Directions: Solve each of the following problems, using the available space for scratch work. After examining the form of the choices, decided which is the best of the choices fiven and place the letter of your choice in the corresponding box on the answer sheet. No credit will be given for anything written in this exam booklet. Do not spend too much time on any one problem.

In this exam:
(1) The exact numerical value of the correct answer does not always appears among the choices given. When this happens, select from among the choices the number that best approximates the exact numerical value.
(2) Unless otherwise specified, the domain of a function f is assumed to be the set of all real numbers x for which $f(x)$ is a real number.
(3) The inverse of a trigonometric function f may be indicated by using the inverse function f^{-1} or with the prefix "arc" (e.g. $\sin^{-1} x = \arcsin x$).
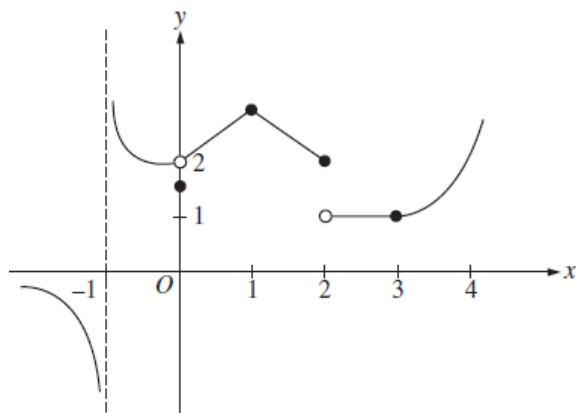
76. The graph of a function f is shown above. If $\lim_{x \to b} f(x)$ exists and f is not continuous at b, then $b =$

(A) -1 (B) 0   (C) 1   (D) 2

77. What is the slope of the line tangent to the curve $3y^2 - 2x^2 = 6 - 2xy$ at point $(3, 2)$?

(A) $\frac{4}{9}$ (B) $\frac{7}{9}$ (C) $\frac{6}{7}$ (D) $\frac{5}{3}$

4

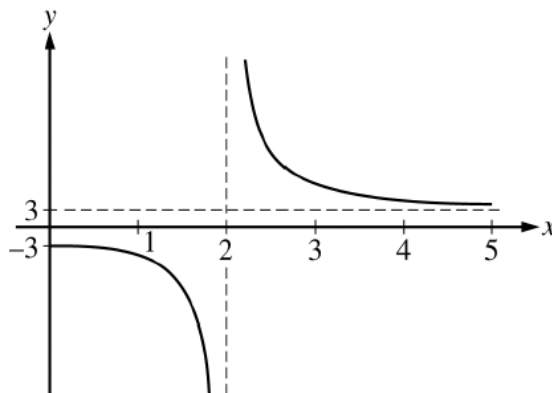| x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
-2	4	2	1	-4
1	-2	-4	3	6
3	1	10	-2	3

78. The table gives values of f, f', g, and g' at selected values of x. If $h(x) = f(g(x))$, then $h'(3) =$

(A) -17 (B) 2   (C) 4   (D) 6

79. Let f be the function given by $f(x) = \sqrt[3]{x} + x^2$. What is the value of c for which the instantaneous rate of change of f at $x = c$ is the same as the average rate of change of f over [1, 6]?

(A) 0.126
(B) 1.390
(C) 3.509
(D) c does not exist

80. The function f is given by $f(x) = \frac{ax^2+12}{x^2+b}$. The figure above shows a portion of the graph of f.
Which of the following could be the values of the constants a and b?

(A) $a = 3, b = 2$
(B) $a = 2, b = -2$
(C) $a = 3, b = -4$
(D) $a = 3, b = 4$

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81. For $t \geq 0$ hours, H is a differentiable function of t that gives the temperature, in degrees Celcius, at an arctic weather station. Which of the follow is the best interpretation of $H'(24)$?

(A) The change in temperature during the 24th hour.
(B) The average rate at which the tuemperature changed during the 24th hour.
(C) The rate at which the temperature is changing during the first day.
(D) The rate at which the temperature is changing at the end of the 24th hour.

82. Which of the following is an equation of the line tangent to the graph of $f(x) = x^4 + 2x^2$ at the point where $f'(x) = 1$?

(A) $y = 8x - 5$
(B) $y = x + 0.352$
(C) $y = x - 0.122$
(D) $y = x - 2.146$

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83. Let f be a function that is differentiable on the open interval $(1,10)$. If $f(2) = -5, f(5) = 5$, and $f(9) = -5$, which of the following must be true?

I. f has at least two zeros.
II.   The graph of f has at least one horizontal tangent.
III.   For some $c, 2 < c < 5, f(c) = 3$

(A) I only
(B) I and II only
(C) I and III only
(D) I, II, and III

84. If the tangent to the graph of the function f at the point (1, 7) passes through the point (–2, –2), then $f'(1)$ is
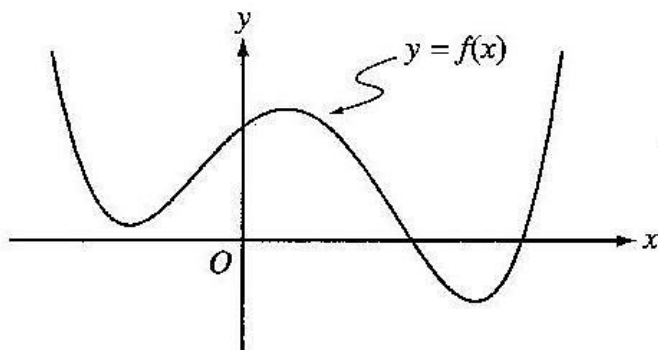
(A) −5   (B) 1   (C) 3   (D) 7

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85. Let f be the function given by $f(x) = 3e^{2x}$ and let g be the function given by $g(x) = 6x^3$. At what values of x do the graphs of f and g have parallel tangent lines?
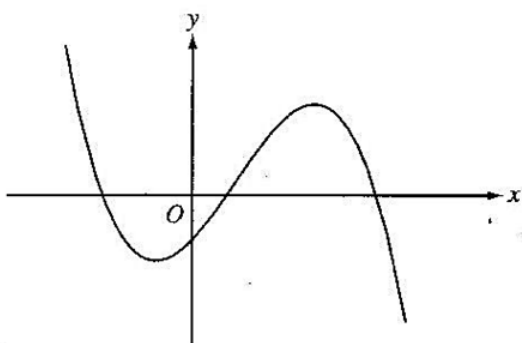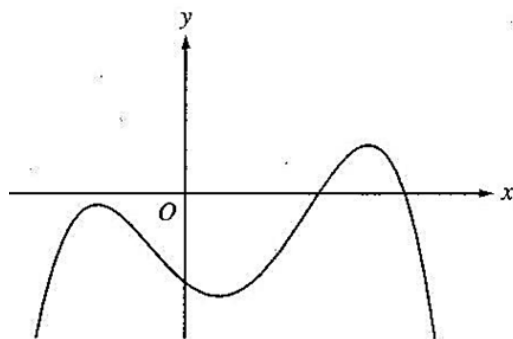
(A) –0.701
(B) –0.567
(C) –0.391
(D) –0.302

86. The graph of $f(x)$ is shown above. Which of the following could be the graph of $f'(x)$?

(A)

(B)

(C)

(D)
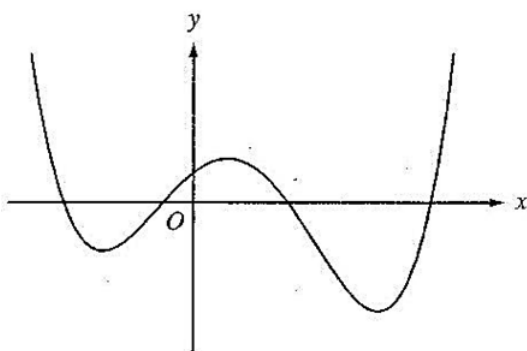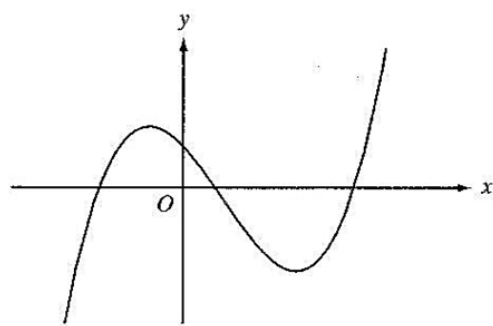
87. If $f(x) = \begin{cases} x^2 + 5, & x < 2 \\ 7x - 5, & x \geq 2 \end{cases}$ for all real numbers x, which of the following must be true?

I. $\lim\limits_{x \to 2} f(x) = 9$

II. $f(x)$ is continuous everywhere.

III. $f(x)$ is differentiable everywhere.

(A) I only   (B) I and II only   (C) II and III only   (D) I, II, and III

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88. Two particles start at the origin and move along the x-axis. For $0 \leq t \leq 10$, their respective position functions are given by $x_1 = \sin t$ and $x_2 = e^{-2t} - 1$. For how many values of t do the particles have the same velocity?

(A) One
(B) Two
(C) Three
(D) Four

10

89. Given $\lim_{h \to 0} \frac{f(6+h)-f(6)}{h} = -2$, which of the following must be true?

    I. $f'(6)$ exists.

    II. $f(x)$ is continuous at $x = 6$.

    III. $f(6) < 0$

(A) I and II only   (B) I and III only   (C) II and III only   (D) I, II, and III

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90. If f is continuous for $a \leq x \leq b$, then at any point $x = c$, where $a < c < b$, which of the following must be true?

(A) $f(c) = \frac{f(b)-f(a)}{b-a}$

(B) $f(c) = 0$

(C) $f(a) < f(c) < f(b)$

(D) $\lim_{h \to c} f(x) = f(c)$

END OF SECTION I

IF YOU FINISH BEFORE TIME IS CALLED,
YOU MAY CHECK YOUR WORK ON PART B ONLY.

DO NOT GO ON TO SECTION II UNTIL YOU ARE TOLD TO DO SO.