12 QUESTS. 36 MIN

AP Calculus AB: Section I, Part B

40 Minutes—Graphing Calculator Required

Notes: (1) The exact numerical value of the correct answer does not always appear 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.

76. If $f(x)=\dfrac{e^{2x}}{2x}$, then $f'(x)=$

$\dfrac{2x\cdot e^{2x}\cdot 2 - e^{2x}\cdot 2}{4x^2} = \dfrac{e^{2x}(4x-2)}{4x^2} = \dfrac{e^{2x}\cdot 2(2x-1)}{4x^2} = \dfrac{e^{2x}(2x-1)}{2x^2}$

(A) 1

(B) $\dfrac{e^{2x}(1-2x)}{2x^2}$

(C) e^{2x}

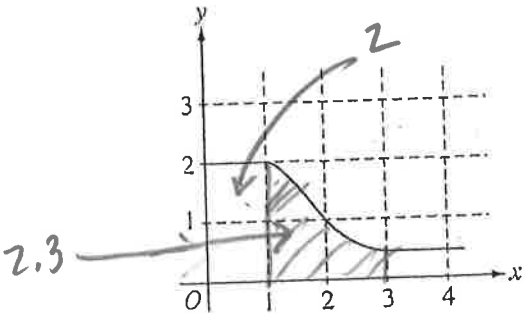
(D) $\dfrac{e^{2x}(2x+1)}{x^2}$

(E) $\dfrac{e^{2x}(2x-1)}{2x^2}$

77. The graph of the function $y=x^3+6x^2+7x-2\cos x$ changes concavity at $x=$

$y' = 3x^2+12x+7+2\sin x$ $\quad y'' = 6x+12+2\cos x$

(A) -1.58 (B) -1.63 (C) -1.67 (D) -1.89 (E) -2.33



78. The graph of f is shown in the figure above. If $\int_1^3 f(x)\,dx = 2.3$ and $F'(x)=f(x)$, then $F(3)-F(0)=$

(A) 0.3 (B) 1.3 (C) 3.3 (D) 4.3 (E) 5.3

79) $f'(2) = 5$

$\therefore$ II, $\therefore$ I

80) $f(x) = 2e^{4x^2}$ OR $f'(x) = 2e^{4x^2} \cdot 8x$

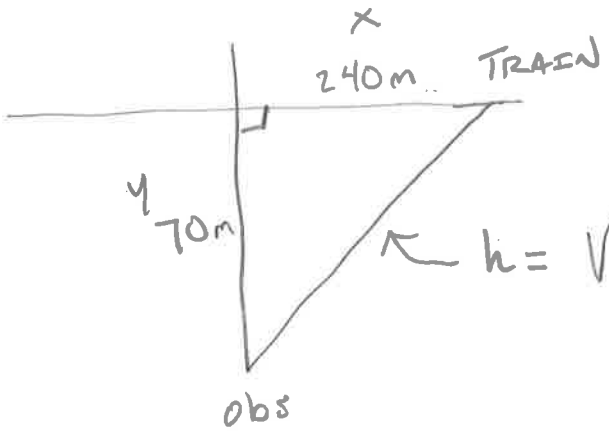
let $y_1 = NDERIV(2e^{4x^2})$

let $y_2 = 3$

FIND INTERSECTION $x \approx .16757746$

~~then FIND f(.16~~

81)



$h = \sqrt{70^2 + 240^2} = 250$

$h^2 = x^2 + y^2$

$2h\frac{dh}{dt} = 2x \cdot \frac{dx}{dt} + 2y\frac{dy}{dt} = 480 \cdot 60 + 140 \cdot 0$

$500\frac{dh}{dt} = 28{,}800$

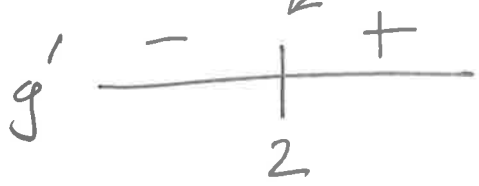
$\frac{dh}{dt} = 57.6 \text{ m/s}$

82) $y = 2x - 8$

a) $g = xy = x(2x-8) = 2x^2 - 8x$ or just graph $x(2x-8)$ + find MIN

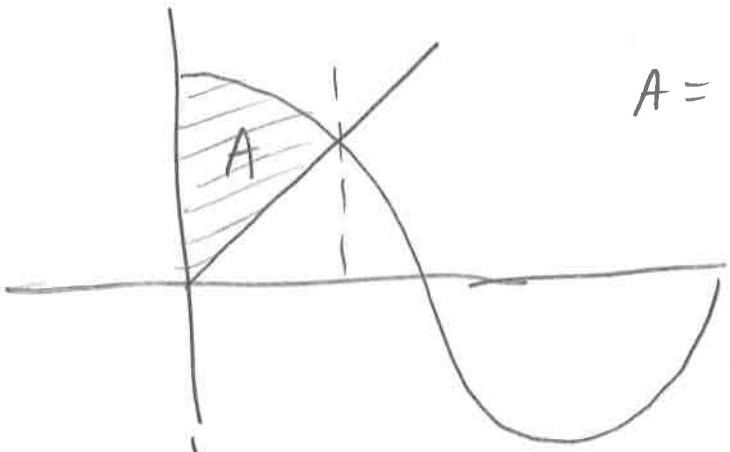
$g' = 4x - 8 = 0 \Rightarrow x = 2$

LOCAL/ABS MIN @ $x=2$



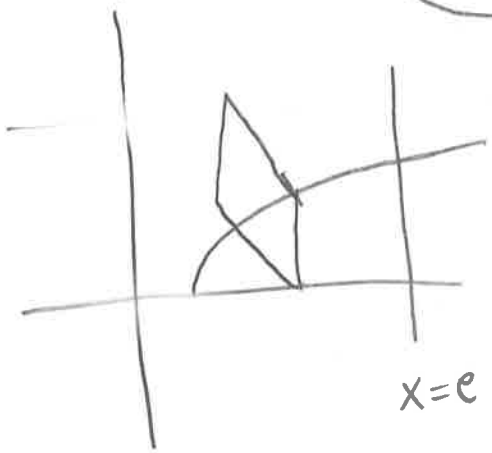
$g(2) = 2 \cdot 4 - 8 \cdot 2 = -8$

83)



$$A = \int_0^{.739085 13} (\cos x - x)\,dx \approx .4$$

84)



$$V = \int_1^e \left(\sqrt{\ln x}\right)^2 dx = 1$$

AP Calculus AB
Chapter 8 – Applications of Definite Integrals

Monday	Tuesday	Wednesday	Thursday	Friday
2/27 **Accumulation and Net Change** Section 8.1 p. 392: 2, 9, 12-16, 18, 20 **ONLINE HW (1-5)**	**2/28** Section 8.1 p. 392: 4, 5, 7, 8, 10, 22 **ONLINE HW (6-10)**	**3/1** **Area in the Plane** Section 8.1/8.2 p. 392: 21, 27, 31, 37-42 p. 402: 3 ,5, 10 **ONLINE HW (11-21,22,23)**	**3/2** Section 8.2 p. 402: 4, 7, 12, 14, 18, 19 **ONLINE HW (20,24-26,30,31)**	**3/3** **NO SCHOOL FOR YOU!**
3/6 **Late Start** Section 8.2 p. 402: 21, 22, 24, 26, 28, 32 **ONLINE HW (27,32-36)**	**3/7** Section 8.2 p. 403: 35, 37, 39, 40, 41, 52 **ONLINE HW (37,38,40,41)**	**3/8** Section 8.2 p. 403: 36, 38, 54, 55 **ONLINE HW (39,42)**	**3/9** **CML #3** **Review 8.1-8.2**	**3/10** **Quiz 8.1-8.2**
3/13 **Late start and Winter Recognition assembly** **Volumes** Section 8.3 p. 414: 3-6 **ONLINE HW (43,44)**	**3/14** Section 8.3 p. 416: 41-44 **ONLINE HW (59,60)**	**3/15** Section 8.3 p. 415: 8, 9, 12, 13, 19 **ONLINE HW (45-48,51)**	**3/16** Section 8.3 p. 415: 10, 16, 18, 20, 23 **ONLINE HW (49,50,52)**	**3/17** **End of quarter** Section 8.3 p. 415: 25, 29, 51, 65 **ONLINE HW (54,56,63)**
3/20 **Quiz 8.3** **ONLINE HW (57,58,61,62,64,65)**	**3/21** **AP Graded Assignment** Review p. 438: 3, 5, 6, 10, 14, 17, 22,24,25, 39	**3/22** **Review**	**3/23** **(PT conferences)** **Chapter 8 Test**	**3/24** 11:30 release **½ Day** **TBA**

****Schedule is subject to change.****

*****If you are absent it is up to you to show me the missing work for credit!!!*****

79. Let f be a function such that $\lim_{h\to 0}\frac{f(2+h)-f(2)}{h}=5$. Which of the following must be true?

I. f is continuous at $x=2$.

II. f is differentiable at $x=2$.

III. The derivative of f is continuous at $x=2$.

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

80. Let f be the function given by $f(x)=2e^{4x^2}$. For what value of x is the slope of the line tangent to the graph of f at $(x,f(x))$ equal to 3?

(A) 0.168 (B) 0.276 (C) 0.318 (D) 0.342 (E) 0.551

81. A railroad track and a road cross at right angles. An observer stands on the road 70 meters south of the crossing and watches an eastbound train traveling at 60 meters per second. At how many meters per second is the train moving away from the observer 4 seconds after it passes through the intersection?

(A) 57.60 (B) 57.88 (C) 59.20 (D) 60.00 (E) 67.40

82. If $y=2x-8$, what is the minimum value of the product xy?

(A) -16 (B) -8 (C) -4 (D) 0 (E) 2

83. What is the area of the region in the first quadrant enclosed by the graphs of $y=\cos x$, $y=x$, and the y-axis?

(A) 0.127 (B) 0.385 (C) 0.400 (D) 0.600 (E) 0.947

84. The base of a solid S is the region enclosed by the graph of $y=\sqrt{\ln x}$, the line $x=e$, and the x-axis. If the cross sections of S perpendicular to the x-axis are squares, then the volume of S is

(A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) 1 (D) 2 (E) $\frac{1}{3}(e^3-1)$

85) graph $f'(x)$ AND find where it goes from + to −.

$x = .91$

86) $f'(x) = \frac{1}{2}x^{-1/2}$

$f'(1) = \frac{1}{2}$

$f'(c) = 1$

$\therefore \quad \frac{1}{2}x^{-1/2} = 1$

$x^{-1/2} = 2$

$\frac{1}{\sqrt{x}} = 2 \Rightarrow \frac{1}{2} = \sqrt{x} \Rightarrow x = \frac{1}{4}$

87) $v(t) = -2 + \int_0^t a(t)\,dt = 0$

graph $v(t)$ AND find where $v(t) = 0$

$v(t) = 0 \quad @ \quad t =$

85. If the derivative of f is given by $f'(x) = e^x - 3x^2$, at which of the following values of x does f have a relative maximum value?

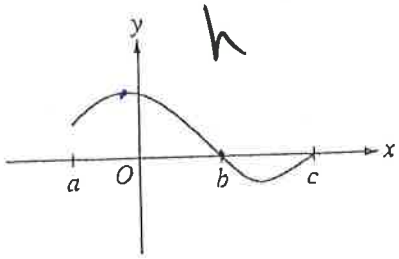
(A) –0.46 (B) 0.20 (C) 0.91 (D) 0.95 (E) 3.73

86. Let $f(x) = \sqrt{x}$. If the rate of change of f at $x = c$ is twice its rate of change at $x = 1$, then $c =$

(A) $\frac{1}{4}$ (B) 1 (C) 4 (D) $\frac{1}{\sqrt{2}}$ (E) $\frac{1}{2\sqrt{2}}$

87. At time $t \geq 0$, the acceleration of a particle moving on the x-axis is $a(t) = t + \sin t$. At $t = 0$, the velocity of the particle is –2. For what value t will the velocity of the particle be zero?

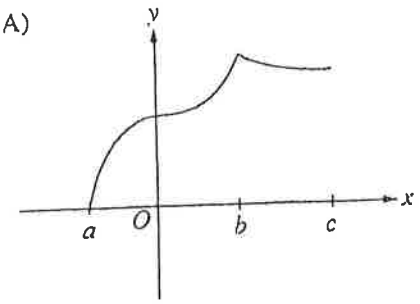
(A) 1.02 (B) 1.48 (C) 1.85 (D) 2.81 (E) 3.14



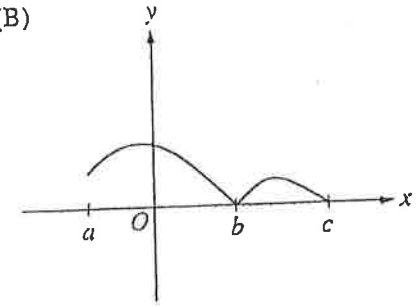
h

88. Let $f(x) = \int_a^x h(t)\,dt$, where h has the graph shown above. Which of the following could be the graph of f?

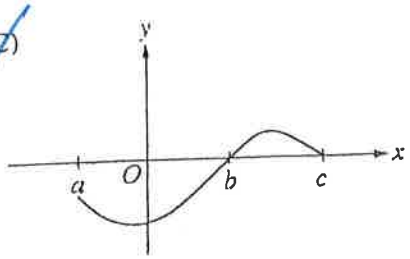
(A)



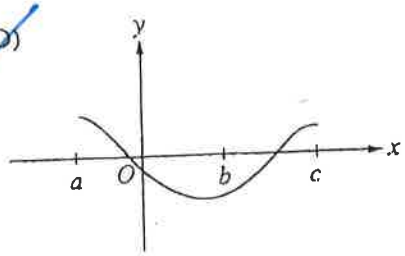
(B)



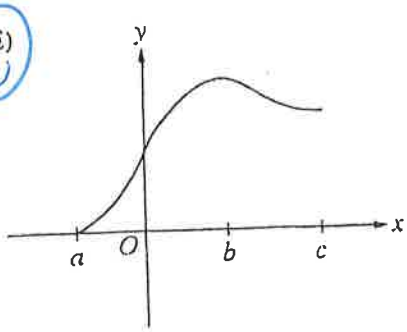
(C)



(D)



(E)



89) $\frac{1}{2}(3+3)\cdot\frac{1}{2} + \frac{1}{2}(3+5)\cdot\frac{1}{2}$

$+\frac{1}{2}(5+8)\cdot\frac{1}{2} + \frac{1}{2}(8+13)\cdot\frac{1}{2}$

$\frac{1}{4}(6+8+13+21)$

$= 12$

x	0	0.5	1.0	1.5	2.0
$f(x)$	3	3	5	8	13

89. A table of values for a continuous function f is shown above. If four equal subintervals of $[0,2]$ are used, which of the following is the trapezoidal approximation of $\int_0^2 f(x)\,dx$?

(A) 8 (B) 12 (C) 16 (D) 24 (E) 32

90. Which of the following are antiderivatives of $f(x) = \sin x \cos x$?

I. $F(x) = \dfrac{\sin^2 x}{2}$

II. $F(x) = \dfrac{\cos^2 x}{2}$

III. $F(x) = \dfrac{-\cos(2x)}{4}$

(A) I only

(B) II only

(C) III only

(D) I and III only

(E) II and III only

$\dfrac{2 \cdot 2 \cdot \sin x \cdot \cos^2 x - 0}{4} = \sin x \cdot \cos x$

$\dfrac{2 \cdot 2 \cos x \cdot -\sin x - 0}{4}$

$\dfrac{4 \cdot \sin(2x) \cdot 2 - 0}{16}$