Calculus AB Review for Last Test (Chapter 8, 9, 10, + More)

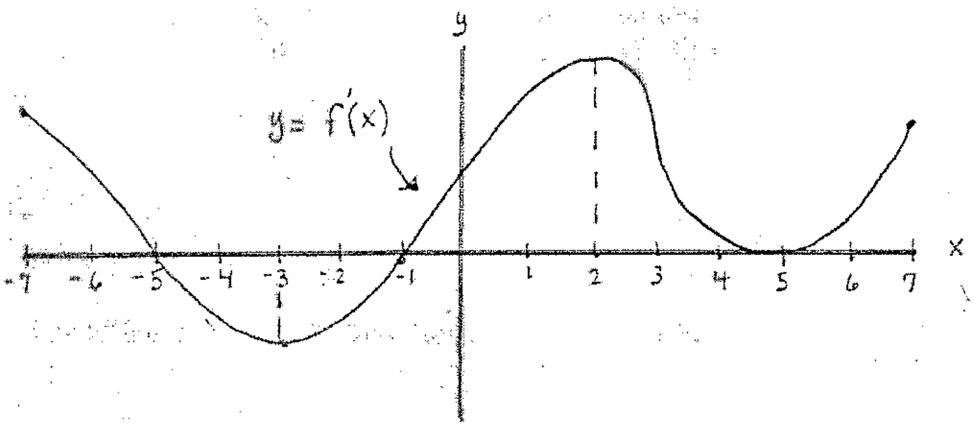
Cat #

1. The values of a function are given in the table

X	0	1	2	3	4	5	6
F(x)	1	2	3	4	6	7	10

A) Sketch curve connecting the seven points above. Draw and label the Riemann Sum rectangles using right hand Riemann Sum – use 6 sub-divisions
B) Find Area with 6 sub-divisions using Riemann Sum – Right endpoints
C) Sketch the same curve connecting the seven points above. Draw 6 trapezoids.
D) State the Trapezoid Rule
E) Use Trapezoid Rule to find the approximate Area from x = 0 to x = 6

2. Cat #



The figure above shows the graph of f', the derivative of the function , f, for $-7<x<7$. The graph of f' has horizontal tangent lines at x = - 3, x = 2, and x = 5, and a vertical tangent line at x = 3.

A) Find all values of x , for $-7 < x < 7$, at which f attains a relative minimum. Justify With a labeled number line and sentence.
B) Find all values of x , for $-7 < x < 7$, at which f attains a relative maximum. Justify With a labeled number line and sentence.
C) Find all values of x , for $-7 < x < 7$, at which $f''(x) < 0$. Justify With a sentence.
D) At what values of x, for $-7 \leq x \leq 7$, does f attain its absolute maximum. Justify with A sentence.
D) If f (- 3) = 0, Graph the function, f, from [-7 , -5]

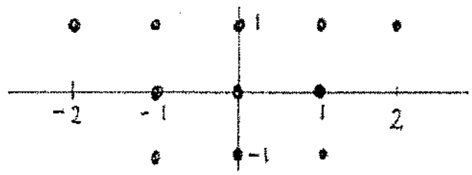
Cat #

3. Region R is bounded by y = ln x, x = 1, x = 4, y = 0
A) Sketch, label, and shade Region R
B) Find Area of Region R
C) Find Volume of the solid obtained by rotating Region R about the y-axis. Sketch region. Use integration by parts to solve.
D) Find Volume of the solid obtained by rotating Region R about the line y = 3. Set up only – do not solve. Sketch region.

Cat # 13

4. Consider the differential equation $\frac{dy}{dx} = x\,(y-1)^2$

A) Sketch the slope field for the given differential equation at the eleven points indicated



B) Separate the differential equation y's with the dy on one side of the equation and x's with the dx on the other side.

C) Find the general solution $y = f(x)$

D) Find the particular solution with the initial condition $f(0) = -1$
Simplify final solution to have no complex fractions

E) Find the range of the function found in part (D) Use L"Hopitals Rule to find solution

Cat # 12/4

5. A) Solve by Integration by Parts : $\int x\, e^{-3x}\, dx$

B) Use L"Hopitals Rule to find limit: $\lim_{x\to 1} \frac{\ln(x)}{2x-2}$

C) $y = \sec^{-1}(x^4)$
Find y'

D) $y = \tan^{-1}(x^3)$
Find y'

E) $\int \frac{1}{9 + x^4}\, x\, dx$

F) Solve by Integration by Parts: $\int_1^2 x \ln(x)\, dx$

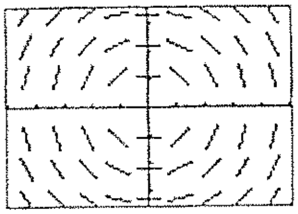
Cat #

Slope Fields

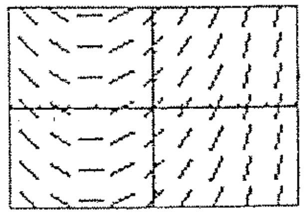
6

Match the slope fields with their differential equations.

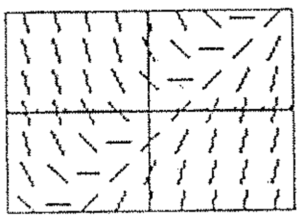
(A)



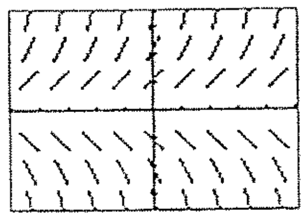
(B)



(C)



(D)



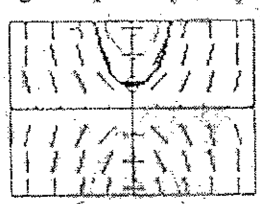
1) $\dfrac{dy}{dx} = \dfrac{1}{2}x + 1$

2) $\dfrac{dy}{dx} = y$

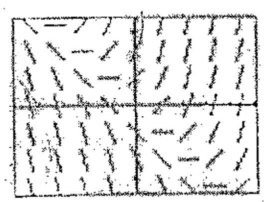
3) $\dfrac{dy}{dx} = x - y$

4) $\dfrac{dy}{dx} = -\dfrac{x}{y}$

E) The calculator drawn slope field for the differential equation $\dfrac{dy}{dx} = xy$ is shown in the figure below. The solution curve passing through the point (0, 1) is also shown.
(a) Sketch the solution curve through the point (0, 2).
(b) Sketch the solution curve through the point $(0, -1)$.



F) The calculator drawn slope field for the differential equation $\dfrac{dy}{dx} = x + y$ is shown in the figure below.
(a) Sketch the solution curve through the point (0, 1).
(b) Sketch the solution curve through the point $(-3, 0)$.



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