

Math 17B
Test 1

Printed Name _____
(FIRST) (LAST)

Signature _____

Please Show All Your Work, and Mark Your Answers Clearly.
No Calculators – No Scratch Paper – No Cell Phones

There are **4 pages** of problems. (The last problem is for extra credit.)

You are expected to do your own work, and to
adhere to the UCD Code of Academic Conduct.

- 1) Simplify all numerical answers.
- 2) Give u and du in problems involving substitution.

Please indicate clearly if you continue work on the back of a page.

Please stop working **immediately** when time is called;
you are subject to a deduction from your test score if you do not.

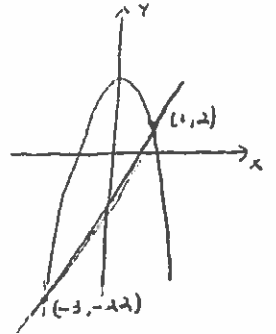
① If $Y = \int_1^{x^2-3} \sqrt{u+8} \, du$, Find $\frac{dY}{dX}$.

6
PTS

② Find $\int_0^3 x \sqrt{9-x^2} \, dx$.

9
PTS

③ Find the area of the region bounded by the graphs of $Y = 5 - 3x^2$ and $Y = 6x - 4$.



9
PTS

④ SET UP, BUT DO NOT EVALUATE, AN INTEGRAL FOR THE AREA OF THE REGION BOUNDED BY THE GRAPHS OF $X = Y^2$ AND $X = -Y^2 + 3Y + 5$.

7
PTS

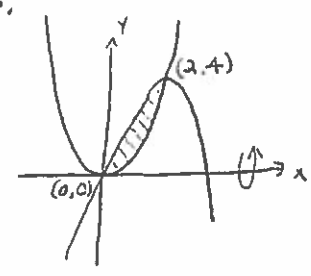
5) FIND $\int_0^1 \frac{x}{x^2+1} dx.$

9
PTS

6) FIND $\int_0^4 \frac{3x}{\sqrt{2x+1}} dx.$

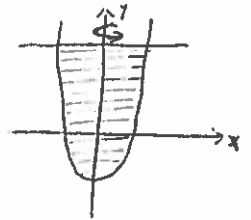
10
PTS

7) FIND THE VOLUME OF THE SOLID GENERATED BY REVOLVING THE REGION BOUNDED BY THE GRAPHS OF $y = x^2$ AND $y = 4x - x^2$ AROUND THE X-AXIS.



10
PTS

- 8) FIND THE VOLUME OF THE SOLID GENERATED BY REVOLVING THE REGION BOUNDED BY THE GRAPHS OF $y = x^2 - 4$ AND $y = 6$ ABOUT THE y -AXIS.



P. 3

9
PTS

- 9) IF THE LENGTH L OF A TYPE OF FISH AT AGE T SATISFIES $\frac{dL}{dT} = 20e^{-T/4}$,
FIND $L(T)$ IF THE FISH IS 5 CM LONG AT BIRTH.
THEN FIND $\lim_{T \rightarrow \infty} L(T)$.

9
PTS

- 10) FIND THE VALUE OF $\int_0^3 \sqrt{36 - x^2} dx$ BY INTERPRETING THIS INTEGRAL AS AN AREA.

10
PTS

(11) Use the definition of the definite integral as a limit of Riemann sums to find P.4
 $\int_2^5 (x^2 + 6x) dx$, using equal subintervals and right endpoints as sampling numbers.

12
PTS

(12) Find $\lim_{n \rightarrow \infty} \sum_{i=1}^n \frac{1}{n+i} = \lim_{n \rightarrow \infty} \left[\frac{1}{n+1} + \frac{1}{n+2} + \frac{1}{n+3} + \dots + \frac{1}{2n} \right]$

10
PTS
(extra
credit)