Standard N03 N04 FORM A
(Antiderivatives & The Fundamental Theorem of Calculus I)

APCalculus - Rentz - Content Assessment (CON) - 30 minutes

START TIME:	Last Name _____	**SCORE**
	Name Called By _____	0 _____ 3
STOP TIME:	Period: (circle one) BLUE PD 4	___ / 15 pts
	Class: 2019(SR) 2020(JR) 2021(SOPH)	____ %
	Date: _____	

NO CALCULATOR FOR THIS STANDARD!

Show your work!

Honor Code Reminders:
Do your own work.
No collaboration.
Use only the technology approved by the teacher for this assessment.
Do not discuss this assessment with other students prior to one week after the assessment UNLESS the teacher discusses details in class before that time.

Do your best!

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1. Find the <u>indefinite integral</u> $\int \cos(x)\, dx$.

2. Find <u>any antiderivative</u> of $f(x) = x^3$.

3. Find the <u>definite integral</u> $\int_0^1 e^x\, dx$.

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In #4 - #13, find the indefinite integral (aka "family of antiderivatives"):

4. $\int (9)\, dx$

5. $\int (x)\, dx$

6. $\int (x^{99})\, dx$

7. $\int (4x^3)\, dx$

8. $\int (100x^{99} - 4x^3 + 15)\, dx$

9. $\int (x^{-1})\, dx$

10. $\int (x^{-4})\, dx$

11. $\int \left(x^{1/2}\right) dx$

12. (Suggestion: Compare/contrast with question #11.) $\int \left(\sqrt{x}\right) dx$

13. $\int (\sin (x))\, dx$

In #14 and #15, find the definite integral.
Use the Fundamental Theorem of Calculus.

14. $\int_1^3 4x^3\, dx = $???   (Show your work.)

Multiple Choice.
Justify your choice by explaining why you rejected an answer.

———   15. $\int_1^2 \left(\frac{5}{x} - 3e^x \right) dx =$

    I. $(5\ln|x| - 3e^x)\big|_1^2$
    II. $(5\ln|x| - 3e^x + e)\big|_1^2$
    III. $\ln(32) - 3e^2 + 3e$

    (a)   I only
    (b)   II only
    (c)   III only
    (d)   I and II only
    (e)   I and III only
    (f)   I, II, and III