Name: _____ Date: _____

QUIZ

Calculus: Integration 1

Review Integration Concepts

Problem Solving

Directions:

You have 20 minutes to use the "Integral Concept", its formal definition, rules of finding Integrals and methods to integrate.

Sketch the graph of the function f(x) when appropriate. Analyze the Graph. Use Trigonometry and integrate.

Draw the areas bounded by curves, Areas by slicing, draw the close intervals where the function is continuous.

Pay close attention to the given Hints.

Grade: _____

Teacher's Signature: _____

1. Apply the Integration Concept.

Evaluate the following Integrals.

A1 $\int_a^b f(x)\,dx =$

A2 $\int_a^a f(x)\,dx =$

A3 $\int_m^n g(x)\,dx =$

A4 $\int_{-1}^{1} h(x)\,dx =$

2. Apply the Integration Concept.

Evaluate the following Integrals.

B1 $$\int_{0}^{\frac{3}{2}\pi} \cos(x)\,dx =$$

B2 $$\int_{1}^{3} e^{x}\,dx =$$

B3 $$\int_{0}^{b} \cos(x)\,dx =$$

3. Areas bounded by curves.

The area of a region bounded by the graph of a function f(x), the x-axis, and the two vertical boundaries (close interval, [a,b]) can be determined directly by evaluating a definite integral.

$$y(x) := e^{x} \qquad -1 \le x \le 2$$

Find the area (A) of the region lying below the graph of y(x), above the x-axis, between the lines x = -1 and x = 2.

Hint:
Draw the graph y = f(x).
Determine the boundaries (i.e., close interval [a, b]).
a. Show the area below the curve.
b. This area is limited by the curve and the x-axis.
c. The open (or close interval) will be at, x = -1, and x = 2

4. Apply the Integration Concept.

What is the integral of "one over cabin" with respect to "cabin"?
Answer: Natural log cabin + c = houseboat.

Hint:
Draw conclusions and discuss.
Represent the math and prove it is true.

5. Apply the Integration Concept.

Two mathematicians are in a bar. The first one says to the second that the average person knows very little about basic mathematics. The second one disagrees, and claims that most people can cope with a reasonable amount of math.

The first mathematician goes off to the washroom, and in his absence the second calls over the waitress. He tells her that in a few minutes, after his friend has returned, he will call her over and ask her a question. All she has to do is answer "one third x cubed."

She repeats "one thir -- dex cue"?
He repeats "one third x cubed".
She asks, "one thir dex cuebd?"
"Yes, that's right," he says.
So she agrees, and goes off mumbling to herself, "one thir dex cuebd...".

The first guy returns and the second proposes a bet to prove his point, that most people do know something about basic math.

He says he will ask the blonde waitress an integral, and the first laughingly agrees.

The second man calls over the waitress and asks "what is the integral of x squared?".

The waitress says "one third x cubed" and while walking away, turns back and says over her shoulder "plus a constant!"

Hint:
Draw conclusions and discuss.
Represent the math and prove it is true.

6. Apply the Integration Concept.

An astrologer, a chemist, and a mathematician are on a bus during their first visit to Scotland. They see a black sheep grazing alone in a pasture as they drive by.

The astrologer excitedly exclaims, "Ah, this shows Scottish sheep are black!"

The chemist didactically corrects him: "No, no, it just shows some Scottish sheep are black."

The mathematician then says, "Actually, we can only be sure there is at least one Scottish sheep of which at least one side is black"

Hint:
Draw conclusions and discuss. Astrologer, Chemist, Mathematician perspective
Why do an Astrologer, a Chemist and a Mathematician think differently?