

Math 230: Applied Calculus II Exam #1A

Week #6

Name: _____

Read Each Question Carefully. Make Sure To Answer The Question That Is Asked. YOU MUST SHOW ALL YOUR WORK FOR FULL CREDIT. A correct answer with no work will be only worth 1 point. Good Luck!

1	15	
2	13	
3	15	
4	13	
5	13	
6	13	
7	13	
8	15	
Total	110	

(1) Evaluate the **definite integral**

$$\int_0^{\frac{1}{3}} \frac{\ln(3x + 2)}{3x + 2} dx$$

(2) Evaluate the **indefinite integral**

$$\int \frac{4e^{2x}}{1 + e^{2x}} dx$$

(3) Evaluate the **definite integral**

$$\int_0^7 xe^{-\frac{x^2}{8}} dx$$

(4) Evaluate the **indefinite integral**

$$\int 8 \sin 3x - 3 \cos 6x + 8 \sec^2 x dx$$

(5) You are given a voltage $V = 400 \sin 150t$.

- (a) Determine the period of the voltage. (Assume t is measured in seconds and supply an answer that is accurate to at least 4 decimal places)
- (b) Calculate the **root-mean-square** voltage for one period. Again, supply an answer that is accurate to at least 4 digits.

(6) Evaluate the **indefinite integral**

$$\int \frac{7}{\sqrt{100 - 9x^2}} dx.$$

(7) Examine the region bounded by $y = 3xe^{-3x}$, the x -axis, $x = 0$ and $x = 2$.

- (a) Draw a picture of the region.
- (b) Determine its area.

(8) Evaluate the **definite integral**

$$\int_2^{23} x \sqrt[3]{3x - 5} dx$$