

(15pts) NAME (printed neatly): Key

(10pts) Section Number (circle correct section): 504 (12:40pm) 505 (9:10am) 506 (11:30am)

Quiz Grade: \_\_\_\_\_

**Directions for taking quizzes:** You may not share calculators. Follow the Aggie Honor Code! Give calculator commands where appropriate.1. (25 pts) If  $\int_3^{12} f(x) dx = 50$  and  $\int_6^3 f(x) dx = 30$ , exactly evaluate  $\int_6^{12} 5f(x) dx$ .

$$\int_3^6 f(x) dx = -30$$

$$\begin{aligned} \int_6^{12} 5f(x) dx &= 5 \int_6^{12} f(x) dx = 5 \left[ \int_3^{12} f(x) dx - \int_3^6 f(x) dx \right] \\ &= 5 (50 - (-30)) \\ &= 400 \end{aligned}$$

2. (25 pts) Find the average value of the function  $f(x) = \frac{e^{2x} - 5}{\sqrt{x^2 + 10}}$  over the interval [2,5]. Use your calculator

to find this average value to 2 decimal places. Write the appropriate calculator command as part of showing your work.

$$f_{\text{ave}} = \frac{1}{5-2} \int_2^5 f(x) dx$$

$$= \frac{1}{3} \text{fnInt} \left( \frac{e^{2x} - 5}{\sqrt{x^2 + 10}}, x, 2, 5 \right)$$

$$\approx 666.55$$

3. (25 pts) Use calculus to find the exact area of the region enclosed between the curves  $y = \frac{1}{8}x^2 + \frac{7}{4}x + 1$  and  $y = \frac{-1}{8}x^2 - \frac{1}{4}x + 13$ .

$$\frac{1}{8}x^2 + \frac{7}{4}x + 1 = -\frac{1}{8}x^2 - \frac{1}{4}x + 13$$

$$\frac{1}{4}x^2 + 2x - 12 = 0 \quad \text{mult 4}$$

$$x^2 + 8x - 48 = 0$$

$$(x+12)(x-4) = 0$$

$$x = -12 \quad x = 4$$

$$\int_{-12}^4 \left[ \left( -\frac{1}{8}x^2 - \frac{1}{4}x + 13 \right) - \left( \frac{1}{8}x^2 + \frac{7}{4}x + 1 \right) \right] dx =$$

$$\int_{-12}^4 \left( -\frac{1}{4}x^2 - 2x + 12 \right) dx =$$

$$\left[ -\frac{1}{12}x^3 - x^2 + 12x \right]_{-12}^4 =$$

$$\frac{80}{3} - -144 =$$

$$\frac{512}{3}$$

NAME: \_\_\_\_\_

MATH 131 SECTION (Circle one):

504   505   506

Circle First Letter of Last Name:

A-D   E-K   L-R   S-Z