

Math 201 Mock Quiz 12

December 2, 2019

Name: _____

Instructions: No calculators. Use provided scrap. Write your fully simplified answers in the space provided.

1. Complete the following anti-derivative formulas:

(a) $\int x^n dx =$ _____ ($n \neq -1$) (b) $\int \frac{1}{x} dx =$ _____

(c) $\int e^x dx =$ _____ (d) $\int \sin x dx =$ _____

(e) $\int \cos x dx =$ _____

2. Find the general anti-derivatives of:

(a) $\int \sec^2 x + 9x^4 dx =$ _____ (b) $\int 14x - 11 dx =$ _____

3. Find a function $f(x)$ that satisfies the conditions: $f''(1) = 4$, $f'(1) = -8$, $f(1) = 13$.

$f(x) =$ _____

4. A shipping company needs to design a closed rectangular shipping crate with a square base that can hold 45000 cubic feet of cargo. The material for the top and sides will cost \$3 per square foot, while the material for the base will cost \$7 per square foot. Calling the base length x and the height y ,

(a) State the objective equation: _____

(b) State the constraint equation: _____

(c) What dimensions will minimize the cost of materials? _____
(State your answer in *length* \times *width* \times *height* format.)

Bonus (Complete the other problems to be eligible):

1. Compute the following:

(a) $\sum_{n=0}^4 \sin \frac{n\pi}{2} =$ _____ (b) $\sum_{i=1}^n (i+1)(i+2) =$ _____

(c) $\lim_{n \rightarrow \infty} \sum_{i=1}^n \left(\frac{2}{n} \left[\left(\frac{2i}{n} \right)^3 + 5 \left(\frac{2i}{n} \right) \right] \right) =$ _____