

MATH 141 WORKSHEET 9

Show all work for full credit.

1. Evaluate the integral.

$$\int \cos x + x + 5^x dx$$

2. Evaluate the integral.

$$\int \frac{x^2 - 4}{3x - 6} dx$$

3. Evaluate the integral.

$$\int (2x^2 + 3)^2 dx$$

4. Evaluate the integral.

$$\int \sec x(\cos x + \tan x) dx$$

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5. Evaluate the integral.

$$\int (2x^3 + 7)(3x^2 + 5) dx$$

6. Evaluate the integral.

$$\int \frac{1}{\cos^2 x} dx$$

7. Evaluate the integral.

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

8. Verify the hypotheses of the Mean Value Theorem are satisfied on the given interval, and find all values c in that interval that satisfy the conclusion of the theorem.

$$f(x) = x^2 + 3x - 10 \text{ over } [3, 7]$$

9. Verify the hypotheses of the Mean Value Theorem are satisfied on the given interval, and find all values c in that interval that satisfy the conclusion of the theorem.

$$f(x) = \frac{1}{2x + 1} \text{ over } [4, 12]$$

10. The function $s(t)$ describes the position of a particle moving along a coordinate line, where s is in feet and t is time in seconds.

$$s(t) = 2t^3 - 15t^2 + 24t + 10$$

a. Find the velocity and acceleration functions.

b. Analyze the motion of the particle for $0 \leq t \leq 5$: When is the particle moving to the left? to the right? When is the particle stopped?

c. When is the particle speeding up? slowing down?

d. Find the total distance traveled by the particle from time $t = 0$ to $t = 5$.