

Sec. 4.5 and 4.6 Review Problems

Simplify the following indefinite integrals.

1. $\int \frac{x}{\sqrt{2x+3}} dx$

2. $\int \frac{dx}{(1-x)^2}$

3. $\int (x+2)(x^2+4x+5)^6 dx$

4. $\int (4x+2) dx$

Evaluate the following definite integrals

5. $\int_0^{\pi} \sin^3 x \cos x dx$

6. $\int_0^1 \frac{x^3}{\sqrt{x^4+9}} dx$

7. Find $\frac{dy}{dx}$ if $y = \int_1^{x^2} \cos t dt$

8. Use the Trapezoidal approximation with $n = 4$ to approximate the value of the integral. Then, find the integral's exact value using a definite integral.

$$\int_0^2 x^3 dx$$

9. Find a trapezoidal approximation of $\int_0^6 f(x)dx$ given the following table of values.

x	0	1	2	3	4	5	6
f(x)	12	10	9	11	13	16	18

10. What is the average value of $f(x) = 3x^2 - 1$ on $[-1, 4]$?

11. A driver averaged 30 mph on a 150 mile trip and then returned over the same 150 miles at the rate of 50 mph. He figured that his average speed was 40 mph for the entire trip.

- A. What was his total distance traveled?
- B. What was his total time spent for the trip?
- C. What was his average speed for the trip?
- D. Explain the error in the driver's reasoning.