

Section 7.5

1. Find the average value of the function

$$f(x) = \sqrt{x+1} \text{ over the interval } [3, 8]$$

2. The temperature in a certain city t hours after 9 A.M. was approximated by the function

$$T(t) = 75 + 12 \sin \frac{\pi t}{12}. \text{ Find the average temperature during the period from 9 A.M. to 9 P.M.}$$

3. Find the numbers b such that the average value of $f(x) = 2 + 6x - 3x^2$ on the interval $[0, b]$ is equal to 4.

4. Find the average value of $f(x) = 4x - x^2$ over the interval $[0, 3]$ and find the value of c that satisfies the Mean Value Theorem for Integrals.

Section 8.1

5. $\int x e^{7x} dx$

$$6. \int 3x \cos x \, dx$$

$$7. \int_0^1 x e^{2x} dx$$

$$8. \int \frac{\ln x}{x^2} dx$$

$$9. \int_2^3 \ln x \, dx$$

10. $\int \arccos x \, dx$

11. $\int x^5 \sin(x^3) dx$

Section 8.2

12. $\int \sin^3 x \cos^6 x dx$

13. $\int \sin^2 x \cos^2 x \, dx$

$$14. \int \tan^3 x \sec^5 x \, dx$$

15. $\int_0^{\pi/4} \tan^8 x \sec^4 x \, dx$

16. $\int \cot^2 x \csc^4 x \, dx$

$$17. \int \frac{\cos^5 x}{\sin^3 x} dx$$