

5.4 The Fundamental Theorem of Calculus

Name:

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P 6. Evaluate and verify your result graphically.

$$\int_{-3}^1 8 \, dt$$

P 8. Evaluate and verify your result graphically.

$$\int_{-1}^2 7 - 3t \, dt$$

P 10. Evaluate and sketch the region that corresponds to

$$\int_1^2 6x^2 - 3x \, dx$$

P 12. Evaluate and sketch the region that corresponds to

$$\int_1^3 4x^3 - 3x^2 dx$$

P 14. Evaluate and sketch the region that corresponds to

$$\int_{-2}^{-1} u - \frac{1}{u^2} du$$

P 16. Evaluate and sketch the region that corresponds to

$$\int_{-8}^8 x^{1/3} dx$$

P 24. Evaluate and verify your result graphically.

$$\int_1^4 3 - |x - 3| dx$$

P 26. Evaluate and sketch the region that corresponds to

$$\int_0^4 |x^2 - 4x + 3| dx$$

P 28. Evaluate and sketch the region that corresponds to

$$\int_0^{\pi} 2 + \cos x \, dx$$

P 36. Evaluate

$$\int_e^{2e} \cos x - \frac{1}{x} \, dx$$

P 44. Find the area of the region bounded by the graphs of

$$y = x^3 + x, \quad x = 2, \quad \text{and} \quad y = 0$$

P 48. Find the area of the region bounded by the graphs of

$$y = e^x, \quad x = 0, \quad x = 2, \quad \text{and} \quad y = 0$$

P 50. Find the value(s) of c guaranteed by the Mean Value Theorem for Integrals for $f(x) = \sqrt{x}$ on the closed interval $[4, 9]$.

P 55. Find the average value of $f(x) = 9 - x^2$ on the closed interval $[-3, 3]$. Then find all x in $[a, b]$ such that $f(x)$ equals the average value.

P 88. Find $F'(x)$.

$$F(x) = \int_1^x \frac{t^2}{t^2 + 1} dt$$

P 94. Find $F'(x)$.

$$F(x) = \int_{-x}^x t^3 dt$$

P 97. Find $F'(x)$.

$$F(x) = \int_0^{x^3} \sin t^2 dt$$