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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Use the Substitution Formula to evaluate the integral $\int_0^1 \sqrt{t^6 + 7t} (6t^5 + 7) dt$.

$\int_0^1 \sqrt{t^6 + 7t} (6t^5 + 7) dt = \frac{32\sqrt{2}}{3}$
 (Type an exact answer, using radicals as needed.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

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For a certain drug, the rate of reaction in appropriate units is given by

$R'(t) = \frac{4}{t+1} + \frac{3}{\sqrt{t+1}}$

where t is time (in hours) after the drug is administered. Find the total reaction to the drug over the following time periods.

a. From $t=1$ to $t=10$ b. From $t=10$ to $t=24$

a. The total reaction is $\frac{18.223}{}$.
 (Do not round until the final answer. Then round to three decimal places as needed.)

b. The total reaction is $\frac{13.384}{}$.
 (Do not round until the final answer. Then round to three decimal places as needed.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

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Use the definite integral to find the area between the x-axis and $f(x)$ over the indicated interval. Check first to see if the graph crosses the x-axis in the given interval.

$f(x) = 1 - x^2; [0, 2]$

The area between the x-axis and $f(x)$ is .
 (Simplify your answer. Type an integer or an improper fraction.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Approximate the area under the graph of $f(x)$ and above the x-axis with rectangles, using the following methods with $n = 4$.

$f(x) = e^x + 7$ from $x = -2$ to $x = 2$

(a) Use left endpoints.
 (b) Use right endpoints.
 (c) Average the answers in parts (a) and (b)
 (d) Use midpoints.

The area, approximated using the left endpoints, is .
 (Round to two decimal places as needed.)

The area, approximated using the right endpoints, is .
 (Round to two decimal places as needed.)

The average of the answers in parts (a) and (b) is .
 (Round to two decimal places as needed.)

The area, approximated using the midpoints, is .
 (Round to two decimal places as needed.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

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The number of bachelor's degrees conferred has been increasing steadily in recent decades. The rate of change of the number of bachelor's degrees (in thousands) can be approximated by the following function where t is the number of years since 1970.

$$B'(t) = 0.0819t^2 - 1.001t + 15.05$$

Complete parts a. and b. below.

a. Find $B(t)$, given that about 831,500 degrees were conferred in 1970 ($t=0$).

$B(t) = \square$

b. Use the formula from part a. to project the number of bachelor's degrees that will be conferred in 2012 ($t=42$).

In 2012 the projected number of bachelor's degrees to be conferred is \square .
 (Do not round until the final answer. Then round to the nearest integer as needed.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

A construction company has an expenditure rate of $E'(x) = e^{0.11x}$ dollars per day on a particular paving job and an income rate of $I'(x) = 119.3 - e^{0.11x}$ dollars per day on the same job, where x is the number of days from the start of the job. The company's profit on that job will equal total income less total expenditures. Profit will be maximized if the job ends at the optimum time, which is the point where the two curves meet.

(a) Find the optimum number of days for the job to last.
 (b) Find the total income for the optimum number of days.
 (c) Find the total expenditures for the optimum number of days.
 (d) Find the maximum profit for the job.

(a) \square days
 (Round to the nearest integer as needed.)

(b) The total income for the optimum number of days will be \square .
 (Round to the nearest cent as needed.)

(c) The total expenditures for the optimum number of days will be \square .
 (Round to the nearest cent as needed.)

(d) The maximum profit for the job will be \square .
 (Round to the nearest cent as needed.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Find the exact value of the integral using formulas from geometry.

$$\int_{-10}^0 \sqrt{100-x^2} dx$$

$$\int_{-10}^0 \sqrt{100-x^2} dx = \square$$

(Type an exact answer, using π as needed.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Use substitution to find the indefinite integral.

$$\int \frac{4x+5}{(10x^2+25x)^8} dx$$

$$\int \frac{4x+5}{(10x^2+25x)^8} dx = \square$$

(Use C as the arbitrary constant. Use integers or fractions for any numbers in the expression.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

The reaction rate to a new drug is given by the following function where t is time (in hours) after the drug is administered.

$$y = e^{-t^2} + \frac{9}{t+9}$$

(a) Find the total reaction to the drug from $t = 1$ to $t = 9$ by letting $n = 8$ and using the trapezoidal rule.

 (Round the final answer to three decimal places as needed. Round all intermediate values to four decimal places as needed.)

(b) Find the total reaction to the drug from $t = 1$ to $t = 9$ by letting $n = 8$ and using Simpson's rule.

 (Round the final answer to three decimal places as needed. Round all intermediate values to four decimal places as needed.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

The marginal revenue (in thousands of dollars) from the sale of x gadgets is given by the following function.

$$R'(x) = 4x(x^2 + 28,000)^{-\frac{2}{3}}$$

a. Find the total revenue function if the revenue from 125 gadgets is \$51,217.
 b. How many gadgets must be sold for a revenue of at least \$45,000?

a. The total revenue function is $R(x) = \square$, given that the revenue from 125 gadgets is \$51,217.

b. gadgets must be sold to generate a revenue of at least \$45,000.
 (Type a whole number.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Use $n = 4$ to approximate the value of the integral by the following methods: (a) the trapezoidal rule, and (b) Simpson's rule. (c) Find the exact value by integration.

$$\int_1^4 \frac{4}{x^2} dx$$

(a) Use the trapezoidal rule to approximate the integral.

$$\int_1^4 \frac{4}{x^2} dx \approx \square$$

(Round the final answer to three decimal places as needed. Round all intermediate values to four decimal places as needed.)

(b) Use Simpson's rule to approximate the integral.

$$\int_1^4 \frac{4}{x^2} dx \approx \square$$

(Round the final answer to three decimal places as needed. Round all intermediate values to four decimal places as needed.)

(c) Find the exact value of the integral by integration.

$$\int_1^4 \frac{4}{x^2} dx = \square$$

(Type an integer or a decimal. Do not round.)

Enter your answer in each of the answer boxes.

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Quiz: Review for Test 4 Overview

This Question: 1 pt This Test: 16 pts 4 of 16 complete

Find $\int (12x + 5)^2 dx$.

$$\int (12x + 5)^2 dx = \square$$

(Use C as the arbitrary constant.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

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This Question: 1 pt This Test: 16 pts 4 of 16 complete

Evaluate the following integral.

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

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

(Use C as the arbitrary constant.)

Enter your answer in the answer box.

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This Question: 1 pt This Test: 16 pts 4 of 16 complete

Find the area of the region bounded by the graphs of the given equations.

$$y = 4x + 12, y = x^2$$

The area is \square .

(Type an integer or a simplified fraction.)

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

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Evaluate the given definite integral.

$$\int_3^4 \left(0.1 e^{-0.1A} + \frac{2}{A} \right) dA$$

$$\int_3^4 \left(0.1 e^{-0.1A} + \frac{2}{A} \right) dA = \square \text{ (Round to three decimal places as needed.)}$$

Enter your answer in the answer box.

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Quiz: Review for Test 4 Overview

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The marginal profit in dollars on Brie cheese sold at a cheese store is given by $P'(x) = x(70x^2 + 30x)$, where x is the amount of cheese sold, in hundreds of pounds. The "profit" is $-\$20$ when no cheese is sold.

a. Find the profit function.
 b. Find the profit from selling 400 pounds of Brie cheese.

a. Find the profit function.
 $P(x) = \square$

b. Find the profit from selling 400 pounds of Brie cheese.
 The profit from selling 400 pounds of Brie cheese is \$ \square .

Enter your answer in each of the answer boxes.

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