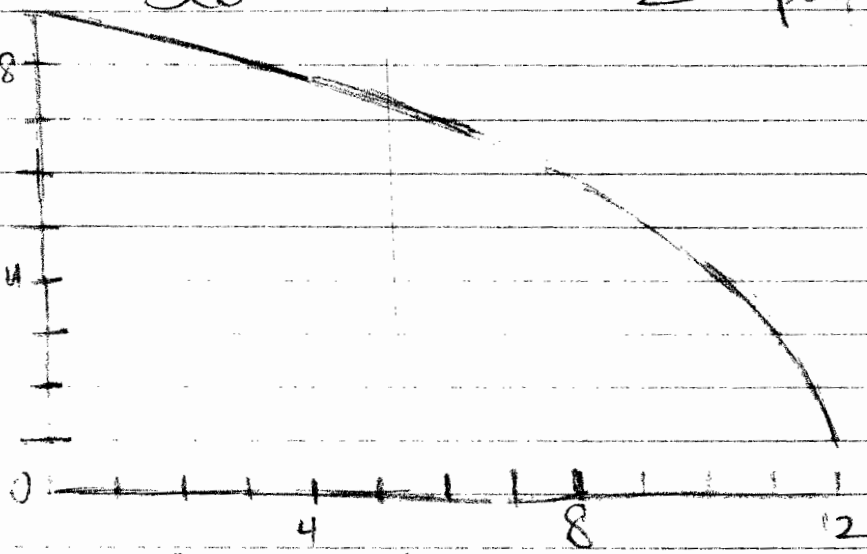
Bill Thompson

Sections 5.1-5.2 page 1

5.1 2)



A) Use six rectangles to find the area of the graph of f from x=0 to x=12

(i) L_6

$2(9+8\frac{3}{4}+8\frac{1}{4}+7\frac{1}{4}+6+4)=86.5$

(ii) R_6

$2(8\frac{3}{4}+8\frac{1}{4}+7\frac{1}{4}+6+4+1)=70.5$

(iii) M_6

$2(8.9+8.5+7.8+6.5+5.1+2.8)=79.2$

B) Is L_6 an overestimate or underestimate of the true area?

It is an overestimate because f is decreasing

C) Is R_6 an overestimate or underestimate?

Underestimate

D) Which of the numbers L_6, R_6, M_6 gives the best estimate?

M_6 gives the best estimate because it is a middleground between the drastic overestimation and drastic underestimation. Also, we will learn later that it is closest to S_6, which is most accurate

Justin Levin

5.5 - The Substitution Rule

1) $\int \frac{\sin\sqrt{x}}{\sqrt{x}}\,dx$, $u = \sqrt{x}$

Evaluate the given integral by making the given substitution

2) $\int \frac{e^x}{e^x + 1}\,dx$

Evaluate the indefinite integral.

3) $\int_{-\pi/2}^{\pi/2} \frac{x^2 \sin x}{1 + x^6}\,dx$

Evaluate the definite integral.

Tyler Stoll

Section 6.1

13) $\int e^{2\theta} \sin 3\theta \, d\theta$

15) $\int_0^{\pi} t \sin 3t \, dt$

Jessica Flores-Vazquez
12/7/10

Problems Section 6.2

(#2) $\int \sin^6 x \cos^3 x \, dx$

(#19) $\tan^2 x \, dx$

(#55) $\int \frac{\sqrt{1+x^2}}{x} \, dx$

TODD COPE

① Find the Volume of the solid obtained by rotating about the y-axis the region between $y=x$ and $y=x^2$

② use cylindrical shells to find the volume of the solid obtained by rotating about the x-axis the region under the curve $y=\sqrt{x}$ from 0 to 1.

③ Set up an integral for the volume obtained by rotating the region bounded by $y=x$ and $y=4x-x^2$ about $x=7$.

MATTHEW JONES

SECTION 6.3

9. $\int \frac{(x-9)}{(x+5)(x-2)}\,dx$

11. $\int_2^3 \frac{1}{x^2-1}\,dx$

19. $\int \frac{1}{(x+5)^2(x-1)}\,dx$

Section 6.4 Review

Tori Mauser-Jeppesen

9. Evaluate $\int \frac{\tan^3(1/z)}{z^2} dz$

17. Evaluate $\int \frac{x^4 dx}{\sqrt{x^{10}-2}}$

21. Evaluate $\int \sqrt{e^{2x}-1}\, dx$

6.5 questions,

③ Estimate $\int_0^1 \cos(x^2)\,dx$ using

a) the Trapezoidal Rule

b) the Midpoint Rule

each with $n=4$.

From a graph of the integrand, decide whether your answers are underestimates or overestimates. What can you conclude about the true value of the integral.

⑮ Use a) the Trapezoidal Rule, b) the Midpoint Rule and c) Simpson's Rule to approximate the given integral with the specified value of n

$$\int_2^3 \frac{1}{1+y^5}\,dy \qquad n=6$$

㉕ Estimate the area under the graph in the figure by using a) the Trapezoidal Rule, b) the Midpoint Rule, c) Simpson's Rule, each with $n=4$

Section 6.6: Improper Integrals — Christopher Yap

(16) $\int_{-\infty}^{6} re^{r/3}\,dr$

(30) $\int_{0}^{1} \frac{dx}{\sqrt{1-x^2}}$

(47) $\int_{0}^{\infty} \frac{1}{\sqrt{x}(1+x)}\,dx$

REVIEW PROBLEMS

Diane Lawrence

7.1 Areas Between Curves:

1. Sketch the enclosed by $y = 12 - x^2$ + $y = x^2 - 6$ + find the area of that region

2. Find the area of the region bounded by the parabola $y = x^2$, the tangent line to this parabola at $(1, 1)$ + the x axis

7.4 Arc Length:

3. find the length of the curve $y = 1 + 6x^{3/2}$ on $0 \leq x \leq 1$.

Sean Urban

Review Problems 7.2

1) Find volume of solid by rotating the region bounded by the specified line. Sketch the region, the solid, and a typical disk or washer.

$x = 2\sqrt{y}$, $x = 0$, $y = 9$, about the y-axis

2) Set up, but do not evaluate, an integral for volume of the solid obtained by rotating the region bounded by the given curves about the line.

$y = \tan^3 x$, $y = 1$, $x = 0$, about $y = 1$

3) Same as #1

$y = x^2$, $x = y^2$, about $x = -1$

Tawni
Paradise

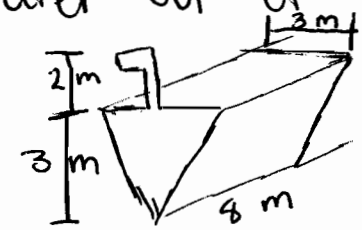
Section 7.5

14) A 10-ft chain weighs 25 lbs and hangs from a ceiling. Find the work done in lifting the lower end of the chain to the ceiling so that it's level with the upper end.

5) A force of 10 lb is required to hold a spring stretched 4 in. beyond its natural length. How much work is done in stretching it from its natural length to 6 in. beyond its natural length.

17) The tank shown is full of water.

(a) Find the work required to pump the water out of the spout



(b) Suppose the pump breaks down after 4.7×10^5 J of work has been done. What is the depth of the water remaining in the tank.

Austin Maul

Ch 7.6 Differential Equations

3 $(x^2+1)\,y' = xy$

5 $(1+\tan y)\,y' = x^2+1$

19 Solve the initial value problem $y' = \frac{\sin x}{\sin y}$ for $y(0) = \frac{\pi}{2}$

7.6 | Differential Equations

Johan Tillberg-Ahne

- Solve the differential equations

1) $y' = y^2 \sin x$

2) $(1 + \tan y)\, y' = x^2 + 1$

- Find the solution of the differential equation that satisfies the given initial condition.

3) $\frac{dy}{dx} = \frac{y \cos x}{1 + y^2}$, $y(0) = 1$

Luke Nicol
8.2 Review
MATH151 Fall '10

Determine whether the series is convergent or divergent; if it converges find the sum.

17. $\sum_{n=1}^{\infty} \arctan(n)$

10. $\sum_{n=1}^{\infty} \frac{n+1}{2n-3}$

Express the number as a ratio of integers.

25. $3.\overline{417} = 3.417417417\ldots$

8.3: Integral and Comparison Tests

Alex Denler

(9) Use the comparison test to determine whether the series is convergent or divergent.

$$\sum_{n=1}^{\infty} \frac{1}{n^2+n+1}$$

Determine whether each series is convergent or divergent:

(15) $$\sum_{n=2}^{\infty} \frac{1}{n \ln(n)}$$

(21) $$\sum_{n=0}^{\infty} \frac{1}{\sqrt{n^2+1}}$$

Kayla Costello

Section 8.4

Approximate the sum of the series correct to four decimal places:

1. $\sum_{n=1}^{\infty} \frac{(-1)^{n-1} n^2}{10^n}$

Determine if the series is absolutely convergent, conditionally convergent, or divergent:

2. $\sum_{n=1}^{\infty} \frac{\cos\left(\frac{n\pi}{3}\right)}{n!}$

3. $\sum_{n=1}^{\infty} \frac{n^n}{3^{1+3n}}$

Kaitlin Soper

Calculus II

Final Exam Review

Power Series

Chapter 8.5 - Questions

① Find the radius of convergence & interval of convergence for the following series:

$$\sum_{n=0}^{\infty} \frac{(x-5)^n}{2^n n}$$

② Find the radius of convergence & interval of convergence for the following series:

$$\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n}}{(2n)!}$$

③ Suppose that $\sum_{n=0}^{\infty} c_n x^n$ converges when $x = -3$ & diverges when $x = 7$

What can be said about the convergence or divergence of the following?

(a) $\sum_{n=0}^{\infty} c_n$ (b) $\sum_{n=0}^{\infty} c_n 10^n$

(c) $\sum_{n=0}^{\infty} c_n (-5)^n$ (d) $\sum_{n=0}^{\infty} (-1)^n c_n 2^n$

8.6

Jackie Watson

5. Find a power series representation for the function and determine the radius of convergence.

$f(x)=\ln(5-x)$

23. Evaluate the indefinite integral as a power series. What is the radius of convergence.

$$\int \frac{t}{1-t^8}\,dt$$

27. Use a power series to approximate the definite integral to six decimal places.

$$\int_0^{.2} \frac{1}{1+x^2}\,dx$$

Patrick Smith
psmith@sandiego.edu

8.7

7. Find the Maclaurin series for $f(x)$ using the definition of a Maclaurin series. [Assume that f has a power series expansion. Do not show that $R_n(x) \to 0$.] Also find the associated radius of convergence.
$f(x) = e^{5x}$

27. Use the Maclaurin series derived in this section to obtain the Maclaurin series for the given function.
$f(x) = \cos(\pi x)$

57. Use multiplication or division of power series to find the first three nonzero terms in the Maclaurin series for the function.
$y = \frac{x}{\sin x}$

Kimberly Su
Math 151-53

Section 8.7 Problems

① Find the Taylor series for $f(x)$ centered at the given value of a. [Assume that f has a power series expansion. Do not show that $R_n(x) \to 0$]. Also, find the radius of convergence.

$f(x) = 1 + x + x^2, \quad a = 2$

② Evaluate the indefinite integral as an infinite series.

$$\int \frac{e^x - 1}{x} \, dx$$

③ Find the sum of the series $\sum_{n=0}^{\infty} (-1)^n \frac{x^{4n}}{n!}$