

Suggested Periods	Section	Topics	Exercises
1	3.8	Exponential Change; recall $a^x = e^{(x \ln a)}$; $\log_a x = (\ln x) / \ln a$ (see pp. 59-60 and A57, A59)	5a, 11, 15, s1-3
1	3.11	Hyperbolic Functions	1, 9, 35, 37, s1-2
.5	5.3	Fundamental Theorem of Calculus	s1-4
1.5	5.5	Substitution Theorem	3, 7, 17, 19, 21, 33, 37, 43, 61, 65, 77, s1
1	App. G	Definition of e via an Integral	s1-3
1	p. 485	Table of Integrals to Memorize, also $\int \sec x$ and $\int \csc x$	s1 10
1	9.3	Separable Differential Equations	13, 15, 17, 21, s1
2	7.1	Integration by Parts	19, 21, 29, 33, 34, 37, 43, 37, 43 (Hint: $u = \sqrt{x}$, $u^2 = x$, $2u du = dx$), 9.3/19
1.5	7.2	Trigonometric Integrals	3, 5, 9, 11, 25, 29, 47. s1
2	7.3	Trigonometric Substitution	9, 11, 13, 17, 19, (Hint: $\tan^2 x = \sec^2 x - 1$) 21 (Hint: $0 \leq x \leq a$ if $0 \leq \theta \leq \pi/2$), 27
2.5	7.4	Rational Functions	7, 8, 18, 23, 41, 43 (Hint: same as 7.1/43), s1-2
.5	7.5	Guidelines for Integration	5(a)-(b), 7 (Hint: $x^3 e^{(x^2)} = x x^2 e^{(x^2)}$), 9, 11, 13, 23, 33, 43 (Hint: symmetry), 45
.5	7.7	Numerical Integration (omit error bounds)	s1-3
2.5	7.8	Improper Integrals	7, 9, 13-21 odd, 27, 37, 57
1	11.1	Sequences	7, 9, 11, 15, 17, 20, 27, 29, 31, 37, 39, 43-49 odd, 53
2	11.2	Series, Geometric Series, Test for Divergence, Telescoping Series	15, 17, 19, 27, 29, 37, 47, 49, s1
2.5	11.3	Integral test	5, 7, 9, 17, 25, 41, s1
2.5	11.4	Comparison Tests	7, 9, 11, 15-31 odd
2	11.5	Alternating Series, Absolute Convergence	5, 7, 11, 13, 19, 23-31 odd, 41, 42, s1
2	11.6	Ratio and Root Test	3-15 odd, 19, 21-27 31, 39, s1
.5	11.7	Guidelines for Testing Series	9-23 odd. 27, 29, 31, 41 (Hint: divide top and bottom 4^n or 5^n)

Suggested Periods	Section	Topics	Exercises
1	11.8	Power Series, Interval of Convergence	3-9 odd, 15, 17, 21, 23, 27, 33 (Hint: factor out 5), s1-2
2.5	11.9	Representing Functions as Power Series	3-9 odd, 23 (find series only), 31 (change limit .3 to .1)
3.5	11.10	Taylor Series, Applications of Power Series	5, 41, 43, 56, 64, s1
2.5	10.3	Polar Coordinates	1-11 odd, 15, 21, 23, only graph polar curves: 33, 35 and 43; s1-3
1	10.4	Polar Integration	3, 7, 9, 11, s1-3
1	10.5	Conic Sections from Second Degree Equations (see notes on 212 webpage)	27, 29, 31, s1-4
2.5	12.1	3-Dimensional Coordinate Systems	5, 7, 17, 19, 27, 31, 39, s1
4	12.6	Quadric Surfaces	13-19 odd, 23-30 all, 33, 37, 39, s1-2

Total: 49 hours

SUPPLEMENTARY HOMEWORK PROBLEMS

3.8/s1. In a certain region, the population, $P(t)$, in thousands of people, t years after census there began, is approximated using an exponential growth model. The initial census showed a population of $P_0 = 90$, and the population two years later was $P(2) = 120$.

- Find a formula for $P(t)$.
- Find the population after 4 years. Simplify the answer, which is an integer.
- Find the population after 5 years. (The answer is not an integer.)
- How long does it take for the population to double?
- How long (i.e., how many years) will it take for the population to reach a million people?

3.8/s2. Two years after opening a bank account in which interest is at 4% compounded continuously, the balance is \$542.

- What was the opening balance of the account?
- Find the balance, $A(t)$, as function of time t in years after opening.

3.8/s3. A culture of bacteria which is placed in a dish has grown to 6 grams after two hours and 24 grams after six hours.

- Find the initial amount of bacteria, expressed an integer.
- Find the function, $A(t)$, of the number of grams in the dish t hours after being placed in the dish.
- Find how many hours after being placed in the dish there will be 20 grams of bacteria.

3.11/s1. Find $\cosh x$ when $\sinh x = 2$.

3.11/s2. Find $\frac{d}{dx}[x^2 \ln(\sinh(5x))]$.

5.3/s1. (a) Differentiate $\frac{x^2}{x^5 + x + 1}$.
(b) Use part (a) to evaluate $\int \frac{-3x^6 + x^2 + 2x}{(x^5 + x + 1)^2} dx$.

5.3/s2. (a) Differentiate $\sin(\sqrt[3]{x^4})$
(b) Use part (a) to evaluate: $\int \sqrt[3]{x} \cos(\sqrt[3]{x^4}) dx$.

5.3/s3. (a) Differentiate $(x^3 + x + 1)e^{2x}$.

(b) Use part (a) to evaluate $\int (2x^3 + 3x^2 + 2x + 3)e^{2x} dx$.

5.3/s4. (a) Differentiate $\frac{\sinh x}{x^2 + 1}$.

(b) Use part (a) to evaluate $\int \frac{(x^2 + 1) \cosh x - 2x \sinh x}{(x^2 + 1)^2} dx$.

5.5/s1. Evaluate: $\int x^2 \sinh(x^3) dx$

App. G/s1. Evaluate: $\int_1^2 2^{3x} dx$

App. G/s2. Evaluate: $\int \frac{y}{y^2 - 25} dx$

App. G/s3. Evaluate: $\int_e^{e^4} \frac{1}{x \log_4 x} dx$

p. 485/s1. Evaluate: $\int_e^{e^4} \frac{1}{x(\ln x)^2} dx$

p. 485/s2. Evaluate: $\int e^{2x} \sec^2 e^{2x} dx$

p. 485/s3. Evaluate: $\int \tan(3x + 1) dx$

p. 485/s4. Evaluate: $\int (\sec x \tan x) e^{\sec x} dx$

p. 485/s5. Evaluate: $\int (2 + e^x)^5 e^x dx$

p. 485/s6. Evaluate: $\int (\sec^2 x)[\tan(\tan x)] dx$

p. 485/s7. Evaluate: $\int \sqrt{x} \sec(x\sqrt{x}) dx$

