

5. Do WebAssign 7.1. Always start with the WebAssign. Remember: if you score 85% or more on the WebAssign, you will be allowed to complete the remaining problems for full credit before Exam 1.

6. Write down an integral that represents the area under $f(\theta) = (e^{\theta+1})^3$ for $0 \leq \theta \leq 2$

Show that this area is equal to $\frac{1}{3}e^3(e^6 - 1)$.

8. Sometimes the problems are more complicated. Use the substitution $w = 1 - z$ to find the anti-derivative $\int (z + 2) \sqrt{(1 - z)} dz$.

Check your answer using the chain rule.

7. Suppose $\int_0^1 f(t) dt = M$. Calculate the following:

(a) $\int_0^{0.5} f(2x) dx$

(b) $\int_0^1 f(1 - t) dt$

9. Use the table to evaluate the integral $\int_0^1 e^x f'(e^x) dx$.

x	0	1	e	3
$f(x)$	5	7	10	11
$f'(x)$	2	4	9	12

Integration by Parts

Understand	Recall the formula for integration by parts.
Understand	Identify integrals for which integration by parts is appropriate.
Understand	Correctly pick u and v' , and catch errors when selection is incorrect.
Apply	Compute basic antiderivatives and definite integrals.
Apply	Repeat integration by parts when necessary.
Synthesize	Find more complicated integrals by using i. by p. to derive and solve integral equations.
Synthesize	Use i. by p. in conjunction with other methods to find more complicated antiderivatives.

1. Derive a general formula for integration by parts. (Hint: start by differentiating the product $u(x)v(x)$. See pg 364-365 for a few more clues.)

2. Use the product rule to differentiate $t \sin(t)$.
 $\frac{d}{dt} [t \sin(t)] =$

3. Use your answer in #2 to find $\int t \cos(t) dt$.

4. Circle which of the following integrals are ideally suited for integration by parts:

$$\int x \ln(x) dx \quad \int y^2 \sin(4y) dy \quad \int \frac{z^2}{1+z^3} dz$$

5. Nick and Ken want to calculate $\int te^t dt$. Nick suggests setting $u = t$ and $v' = e^t$. Ken suggests setting $u = e^t$ and $v' = t$. Explain why Ken is wrong and Nick is right. Be precise.