

9. Estimate $\int_1^5 \cos^4 x \, dx$ using the midpoints of 5 evenly spaced rectangles. (Nearest Thousandth)
- a) 1.178 b) 1.185 c) 1.188 d) 1.196 e) none of these
14. If you evaluate $\int 4x^2 e^{2x} \, dx$, the sum of the numerical coefficients of all terms except the constant of integration is?
- a) 0 b) 2 c) 5 d) $\frac{1}{2}$ e) none of these
17. The number of bacteria in a culture increases from 600 to 1200 in 2 hours. Assuming that the rate of increase is directly proportional to the number of bacteria present, find the number of bacteria at the end of 5 hours. (Round to the nearest whole number.)
- a) 2400 b) 3394 c) 5400 d) 9353 e) none of these
26. Set up the integral that would be used to find the length of $f(x) = x^2 + y^2 = 9$ from $(0, 3)$ to $(3, 0)$.
- a) $3\pi/2$ b) $\int_0^3 \sqrt{1 + \sqrt{9 - x^2}} \, dx$ c) $\int_0^\pi 3 \, dx$ d) $\int_0^3 \frac{3}{\sqrt{9 - x^2}} \, dx$ e) none of these
31. Find the interval of convergence of the series: $\sum_{n=1}^{\infty} \frac{(x-3)^n}{n(4^n)}$
- a) $-1 < x < 7$ b) $-1 \leq x < 7$ c) $-1 < x \leq 7$ d) $-1 \leq x \leq 7$ e) none of these
41. Show all your work for this problem.
- a. Find the first five terms of a Maclaurin Series for $f(x) = 3x e^{2x}$.
- b. Find the first four terms of the Taylor Series for $g(x) = \sin(x)$ centered about $c = \pi/3$.
- c. What is the maximum error if the series found in part b above is used to estimate $\sin(58^\circ)$?