

MA 162 Spring 2003, Answers to Exam II.

1) $-\frac{\sin^5(x)}{5} + \frac{\sin^3(x)}{3} + C$

2) $\frac{\sqrt{x^2-4}}{2x} + C$

3) $\int_1^\infty x e^{-x} dx = -2e^{-1}$, so the series converges.

4) $\frac{a}{(2x+3)^2} + \frac{b}{(2x+3)} + \frac{c}{(x-1)} + \frac{dx+e}{(x^2+9)}$

5) *A*-Partial fractions; *B*-Trigonometric substitution; *C*- Integrate by parts; *D*-Trigonometric integrals; *E*-Approximate integration; *F*-Improper integration.

6) $\frac{76}{3}$

7) $\int_0^\pi 2\pi \sin(x^2) \sqrt{1 + 4x^2 \cos^2(x^2)} dx$

8) $\frac{6}{5}$

9) *a*-divergent, since $a_n \not\rightarrow 0$ as $n \rightarrow \infty$. *b*-converges by the ratio test. *c*- diverges using the comparison test, comparing with the series $\sum_{n=1}^\infty \frac{1}{n}$.