

## Math 141 Fall 2003 Final Exam Answers

1.a, 2.e, 3. d, 4.a, 5.a, 6.b, 7.b, 8.d, 9.c, 10.b, 11.a, 12.b, 13.c, 14.b

15.  $-2\pi$ .

16.  $4 - \frac{4}{e^4}$ .

17.(a) conditionally convergent (alternating series test and limit comparison test)

(b) absolutely convergent (root test)

(c) absolutely convergent (ratio test)

18.  $\pi$ .

19.(a)  $\sum_{n=0}^{\infty} (-1)^{n+1} \frac{2^{2n+1}}{(2n+1)!} \left(x - \frac{\pi}{2}\right)^{2n+1} = -\frac{2}{1!} \left(x - \frac{\pi}{2}\right) + \frac{8}{3!} \left(x - \frac{\pi}{2}\right)^3 - \frac{32}{5!} \left(x - \frac{\pi}{2}\right)^5 + \dots$

(b)  $-\frac{5}{6}$

(c)  $\frac{1}{120}$