

Last Name:
First Name:
Instructor:

Math 151
Group Final (Fall 2004)

This is the part of the Math 151 Final Exam that is common to all sections.

You are not allowed to use notes, books, calculators, personal stereos or cell phones.

You have exactly one hour. You will not be handed the second part of the exam before 9 AM. If you finish this part before 9 AM, hand in your paper to the proctor and remain in your seat.

Points

1. _____/15

2. _____/15

3. _____/15

4. _____/10

5. _____/10

6. _____/10

7. _____/10

8 _____/15

1.(15 pts) Determine

$$\int x e^{-x/2} dx$$

2 (15 pts.) Determine

$$\int \arcsin(x) dx$$

3 (15 pts.) Determine

$$\int \frac{x + 23}{x^2 - 3x - 10} dx$$

4 (10 pts.) Use the ratio test to determine whether the infinite series

$$\sum_{n=1}^{\infty} (-1)^{n-1} \frac{3^n}{n!}$$

converges absolutely or diverges.

5. (10 pts.) Use the integral test to determine whether the infinite series

$$\sum_{n=2}^{\infty} \frac{1}{n \ln^4(n)}$$

converges or diverges.

6 (10 pts.) Determine the radius of convergence and the open interval of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{(x-2)^n}{2^n n^2}.$$

(You need not investigate the series at the endpoints of the interval.)

7 (10 pts.) Determine the Maclaurin polynomial of order 3 for $(x + 1)^{1/3}$.

8. Let

$$r = f(\theta) = 1 - 2 \cos(\theta).$$

a) (5 pts) Sketch the graph of $r = f(\theta)$ in the Cartesian θr -plane on the interval $[0, 2\pi]$. Indicate the values of θ at which $f(\theta) = 0$ and the points at which f attains a maximum or minimum value.

b) (10 pts.) Sketch the graph of $r = f(\theta)$ as a polar equation in the xy -plane (ie, $x = r \cos(\theta)$, $y = r \sin(\theta)$).