

Your Name / Adınız - Soyadınız

Your Signature / İmza

Student ID # / Öğrenci No



Professor's Name / Öğretim Üyesi

Your Department / Bölüm

- This exam is closed book.
- Give your answers in exact form (for example $\frac{\pi}{3}$ or $5\sqrt{3}$), except as noted in particular problems.
- Calculators, cell phones are not allowed.
- In order to receive credit, you must **show all of your work**. If you do not indicate the way in which you solved a problem, you may get little or no credit for it, even if your answer is correct. **Show your work in evaluating any limits, derivatives**.
- Place a box around your answer to each question.
- If you need more room, use the backs of the pages and indicate that you have done so.
- Do not ask the invigilator anything.
- This exam has 3 pages plus this cover sheet and 4 problems. Please make sure that your exam is complete.
- . Time limit is 90 min.

Do not write in the table to the right.

Problem	Points	Score
1	25	
2	25	
3	25	
4	25	
Total:	100	

1. (a) 9 Points Evaluate the integral $\int x^2 \sin x \, dx$.

(b) 9 Points Evaluate the integral
$$\int \frac{t^2 + 8}{t^2 - 5t + 6} dt$$
.

(c) 7 Points Determine if the integral $\int_0^\infty \frac{dx}{\sqrt{x^6+1}}$ converges or diverges. Explain your answer.

2. (a) 8 Points Does the series $\sum_{n=0}^{\infty} (-1)^n \frac{5}{4^n}$ converge? If so, find its sum.

(b) 9 Points Determine if the series $\sum_{n=1}^{\infty} \frac{(n+3)!}{3!n!3^n}$ converges or diverges. Give reasons.

(c) 8 Points Does $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$ converge absolutely, which converge, and which diverge? Give reasons.

3. (a) 15 Points Find the radius and interval of convergence for $\sum_{n=0}^{\infty} \frac{n(x+3)^n}{5^n}$

(b) 10 Points Find the Taylor series at x = 0 for $f(x) = \frac{x^2}{1 - 2x}$. Give the radius of convergence.

4. (a) 8 Points Find parametrization for the line segment joining the points (0, 1, 1) and (0, -1, 1).

(b) 8 Points Find the equation for the plane through $P_0(2,4,5)$ perpendicular to the line

x = 5 + t, y = 1 + 3t, z = 4t

(c) 9 Points Find the area of the triangle whose vertices are A(1, -1, 1), B(0, 1, 1), and C(1, 0, -1).