MIDTERM TEST
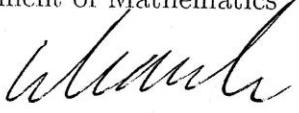Semester 3, Academic year 2010-2011
Duration: 90 minutes

SUBJECT: Calculus 2	
Head of Department of Mathematics	Lecturer:
Signature:	Signature:
Full name: Prof. Phan Quoc Khanh	Full name: Assoc.Prof. Mai Duc Thanh

Instructions:

- *OPEN-BOOK test.*

- *Each question carries 20 marks.*

Question 1. Determine whether the sequence converges or diverges. If it converges. find the limit.

a) $a_n = \dfrac{4n+1}{2n+3}$,   b) $a_n = \sqrt{n+9} - \sqrt{n}$.

Question 2. Determine whether the following series is convergent or divergent. If it is convergent, find its sum.

a) $\sum_{n=1}^{\infty} \dfrac{n-2}{3n+1}$,   b) $\sum_{n=0}^{\infty} \dfrac{2^n+5^n}{10^n}$.

Question 3. Test the series for convergence or divergence. If the series converges, determine whether it absolutely converges.

a) $\sum_{n=1}^{\infty} \dfrac{(-1)^{n-1}}{2n+1}$,   b) $\sum_{n=1}^{\infty} \dfrac{\sin(n^3)}{n^2}$.

Question 4. Find the radius of convergence and interval of convergence of the power series

a) $\sum_{n=1}^{\infty} \dfrac{(x-1)^n}{\sqrt{n+1}}$,   b) $\sum_{n=1}^{\infty} \dfrac{(-3)^n(x+2)^n}{n2^{2n}}$.

Question 5. a) Find the distance between the skew lines with parametric equations $x = 3 - t, y = 1 + 2t, z = -1 + t$ and $x = 1 + 2s, y = 2 - s, z = s$.

b) Find the distance from the point $A(3, 2, 1)$ to the plane through the points $B(1, -1, 0), C(0, 2, 1)$. and $D(2, 0, -1)$.