Quiz Math102 **02.06.2008**

Name
Stud ID

1) True or False? **JUSTIFY your answer FOR BOTH the true or false cases.**

a) The series $\sum_{n=1}^{\infty} \frac{1}{n^{\ln(n)}}$ diverges. T F

b) The sum of the series $\sum_{n=2}^{\infty} \left(\frac{2}{3}\right)^n$ equals $\frac{4}{3}$. T F

c) The series $\sum_{n=1}^{\infty} (-1)^n \frac{n+\ln(n+1)}{n\sqrt{n+1}-1}$ is convergent. T F

2) Compute the Taylor expansion of $f(x) = xe^x$ at $a = -1$.

Solution:

3) Compute (exactly !) the sums of the following series:

a) $\sum_{n=0}^{\infty} (-1)^n \frac{x^{2n+1}}{(2n)!}$

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

c) $\sum_{n=1}^{\infty} n^2 \sin^n(1)$

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4)

a) Compute the length of the curve $x = \frac{y^2}{4} - \frac{\ln(2y)}{2}, \quad 1 \le y \le 2$.

Solution:

b) Compute the area of the surface obtained by rotating the curve

$$x = \frac{y^2}{4} - \frac{\ln(2y)}{2}, \quad 1 \le y \le 2$$

about the *x*-axis.

Solution:

DRAFT PAGE: here you can try your solutions.
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