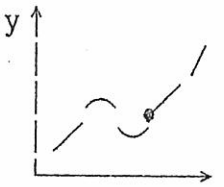
# 國立臺灣大學101學年度轉學生招生考試試題

題號： 26
科目：微積分(C)



1. 

parametric curve $x = x(t)$, $y = y(t)$
when $t=2$, $x(2)=4$, $x'(2)=2$, $x''(2)=5$,
$y(2)=2$, $y'(2)=2$, $y''(2)=1$,
find $\frac{d^2y}{dx^2}(x=4) = ?$ (20/100)

2. $\lim_{n\to\infty} \left(\frac{n}{(1+n^2)} + \frac{n}{(4+n^2)} + \cdots + \frac{n}{(i^2+n^2)} + \cdots + \frac{n}{(n^2+n^2)}\right) = ?$ (20/100)

3. Use Lagrange multiplier or any other method to find the maximum and minimum of $f(x,y) = x^3 + y^3 + 3xy$ in the closed unit disk $x^2 + y^2 \leq 1$. (20/100)

4. $y = f(x)$ is an implicit function defined by $x^3 + y^3 = 1$
Find maximum, minimum, inflection points, asymptotes and sketch its graph. (20/100)

5. Suppose that a bank teller takes an exponentially distributed length of time with mean $\mu = 2$ minutes to serve each customer. If there is already one customer waiting in line, what is the probability that you will wait for more than 6 minutes? (20/100)

**試題隨卷繳回**