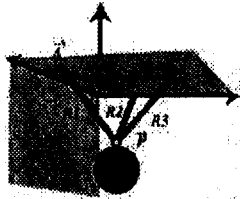


台北醫學大學微積分第一次平時測驗命題紙

系級	授課教師	考試日期	學號	姓名
醫學系	潘力誠			

1. Let $\vec{F} = (1, 2, 3)$, and let ρ be the plane $x + y + z = 3$. Find the component of \vec{F} normal to ρ and the projection of \vec{F} normal to ρ . (10%)
2. Find the nth order Taylor polynomial for $\cos(x)$. (10%)
3. Compute the derivative of function $f(x) = \frac{(x^2 + 2x + 3 - \sqrt{2}) \tan x}{x^2 - \pi x}$. (10%)
4. Find the extrema of $f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$. (10%)
5. Find the slope of a logistic function $f(t) = \frac{1.25}{1 + 1.25e^{-0.4t}}$ at $t=10$ (10%)
6. Three ropes of lengths, R_1 , R_2 , and R_3 are suspended from the ceiling at positions \vec{A} , \vec{B} , and \vec{C} as in the figure. The other ends are tied to a weight at \vec{P} that pulls the ropes tight. Find the coordinate of \vec{P} given that $R_1=2$, $R_2=1.5$, $R_3=1.5$, $\vec{A}=(1,0,0)$, $\vec{B}=(0,1,0)$, and $\vec{C}=(1,1,0)$. (10%)


7. Approximate the root of $y = x^3 + 3x^2 - 5$, using Newton's method and $c_0 = 1$ as initial guess. (10%)
8. Sketch the trace of vector $\vec{r} = \vec{r}_1 + \vec{r}_2$, where $\vec{r}_1 = (2t + 1, -2t)$ and $\vec{r}_2 = (\cos(2\pi t), \sin(2\pi t))$. (10%)
9. Find the equation of the normal line to the graph of $f(x) = \ln(x^2 + 1)^2$, at $x = 5$. (10%)

10. Find the least square line for the given data. (10%)

X	y
10	84
20	71
30	80
40	73
50	60
60	52
70	56
80	46
90	36