MATHEMATICS-1 **Test2-A** **NAME: .....**

24 November 2010

1. (5p)	2. (6p)	3. (9p)	4.(4p)	5. (6p)	6. (6p)	Th. (4p)	Σ (Max 40p)

Corrected by: ……

1. Let be given the matrices $A=\begin{pmatrix}1 & 4 & 0\\ 2 & 0 & 3\end{pmatrix}$, $B=\begin{pmatrix}1\\ 1\end{pmatrix}$ and $C=\begin{pmatrix}2 & 1\\ 1 & 0\end{pmatrix}$

   Find 2A; A*B ; C*B ; B+C !

2. Find the following integrals: a.) $\int 3x^8+\frac{5}{x^2+1}\,dx$; b.) $\int 3x^2\cdot\ln x\;dx$;

3. Find the following integrals

   a.) $\int\frac{x-2}{x\cdot\left(x^2+1\right)}\,dx$; b.) $\int_0^1\left(x^7+5x-2\right)^4\cdot\left(7x^6+5\right)\,dx$

4. Find the area between $f(x)=x^2$ and $g(x)=2-x$ over the interval [0; 2] !

5. Find the arc length of the function $f(x)=\frac{2}{3}\sqrt{(x+2)^3}$ over the interval [1 ; 6]!

6. Find the following improper integral: $\int_0^\infty\frac{2}{x^2+8x+15}\,dx$

Theoretical question:

Show that the equation of the plane passing through the point $P_0=(x_0,y_0,z_0)$ and perpendicular to the vector $\underline{n}=n_x\underline{i}+n_y\underline{j}+n_z\underline{k}$ is $n_x(x-x_0)+n_y(y-y_0)+n_z(z-z_0)=0$