

8 January 2010

1. (6p)	2. (7p)	3. (13p)	4. (8p)	5. (7p)	6. (6p)	7. (7p)	Th. (6p)	Σ (Max 60p)	MW	Σ +MW

Corrected by:

- Let be given the points $P_1=(1, 1, 2)$, $P_2=(1, 5, 6)$ and $P_3=(2, 2, 6)$.
 - Find the dot product and the cross product of the vectors $\overrightarrow{P_1P_2}$ and $\overrightarrow{P_1P_3}$!
 - Find the equation of the plane passing through the points P_1 , P_2 and P_3 !
- Find the derivative of the following functions
 - by definition: $f(x) = \frac{1}{\sqrt{x}}$
 - by rules: $g(x) = \frac{x+3}{\cos(x^2)}$
- Sketch the graph of the function $f(x) = -3 - x - \frac{4}{x-3}$
- Find the following integrals:
 - $\int (3x+2) \cdot e^{2x} dx$
 - $\int \frac{x^2+4x+9}{x \cdot (x+3)^2} dx$
- Find the arc length of $f(x) = \frac{4 \cdot \sqrt{x^3}}{3}$ over the interval $[0;6]$!
- Evaluate the following improper integral: $\int_1^9 \frac{2}{\sqrt[3]{x-1}} dx$
- Find the solution set of the following linear system:

$$\begin{array}{rrcr} x & + & 2y & + & z & = & 0 \\ 2x & + & 5y & - & z & = & 17 \\ -x & + & 2y & + & z & = & -2 \end{array}$$

Theoretical question:

Show that $\lim_{x \rightarrow 0^+} \frac{\sin x}{x} = 1$