Quiz Math101 **22.10.2007**

Stud ID
Name

1) Find the slope of the tangent line to the curve $y = \frac{x}{3} - \frac{3}{x}$ at the point P(3,0).

Solution:

2) Compute

$$\lim_{t \to 0} \left(\frac{1}{t\sqrt{1+t}} - \frac{1}{t} \right)$$

Solution:

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3) We consider the function

$$f(x)=\begin{cases} 2(x+2)\arctan\dfrac{1}{x+1} & \textit{for} \quad x<-1 \\ \pi\cos(\pi x) & \textit{for} \quad -1\le x\le 1 \\ \dfrac{1}{x^3-1} & \textit{for} \quad 1<x \end{cases}$$

a) Where is f **continuous**?

b) At each point $a\in\mathbb{R}$ where f is **discontinuous**, determine the type of discontinuity.

Solution:

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4) Consider the function f whose graph is given below. Sketch **carefully** the graph of its derivative f'.