Exercises

E24.1 [1TN] Note: *Exercise 2, written exam 4 April 2009.*

- Verify that for every $t > 1$ the equation

$$\sin x = x^t$$

  admits one and only one solution $x > 0$.

- Call $f(t)$ this solution, determine the image of the function t and show that it is strictly increasing and continuous on $(1, +\infty)$.

- Prove that f is extended by continuity to $t = 1$ and discuss the existence of the right derivative of the prolonged function at that point.

Solution 1. *[1TP]*