

### Worksheet

**Problem 1.** a) Find  $f$  such that  $f'(x) = \sin x - x$  and  $f(\pi) = 0$ .

b) Find  $g$  such that  $g''(t) = \sinh t - \cosh t + t^{-3}$  such that  $g(1) = g'(1) = 0$

**Problem 2.** Use the Newton's method:

a) to find the third approximation of the root  $x^5 + 2 = 0$  with the initial approximation  $x_1 = -1$ ,

b) to approximate all roots of  $2 \cos x = x^4$  to six decimal places (how many roots does this equation have)?.