

**MATH 413**  
**Fall 2007**  
**Lab2**

**Exercise Set 1.3 and 2.2**

**Exercise 1**

(0 pt)

Exercise Set 1.3 Exercise 3 a) c) e) g)

Use three-digit rounding arithmetic to perform the following calculations. Compute the absolute error and relative error with the exact value determined to at least five digits (using maple).

1.  $133 + 0.921$
2.  $(121 - 0.327) - 119$
3.  $\frac{\frac{13}{14} - \frac{6}{7}}{2e^{-5.4}}$
4.  $\frac{2}{9} * \frac{9}{7}$

**Exercise 2**

(4 pt)

Exercise Set 2.2 Exercise 4 a) c)

Use the Bisection method to find solutions accurate to within  $10^{-2}$  for  $x^4 - 2x^3 - 4x^2 + 4x + 4 = 0$  on each interval (using 413 Tutorial).

1.  $[-2, -1]$
2.  $[2, 3]$

**Exercise 3**

(4 pt)

Exercise Set 2.2 Exercise 8 a) c)

Let  $f(x) = (x + 2)(x + 1)^2x(x - 1)^3(x - 2)$ . To which zero of  $f$  does the Bisection method converge for the following intervals?

1.  $[-1.5, 2.5]$
2.  $[-0.5, 3]$

**Exercise 4**

(2 pt)

Use

$$\frac{b - a}{2^n} < Tol = \epsilon \tag{1}$$

with  $\epsilon = 10^{-6}$  to estimate  $n$  in Exercise 3.1 by calculator. Compare  $n$  with the computed output.