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Date: 20.11.02
Homework number: 1
Homework Title: Exercise 1.2

Problem description:

What are the absolute and relative errors in approximating π by each of the following quantities?

- (a) 3
- (b) 3.14
- (c) 22/7

Problem solution:

Find true value of π and select the number of digits in your floating point arithmetic.

By definition:

absolute error = approximate value - true value

relative error = absolute error / true value

Results:

True value for π for 5 digits = 3.1416

(a) absolute error: $3 - 3.1416 = -0.1416$, relative error: $0.1416 / 3.1416 = 4.57\%$

(b) absolute error: $3.14 - 3.1416 = -0.0016$, relative error: $0.0016 / 3.1416 = 0.051\%$

(c) absolute error: $3.1429 - 3.1416 = 0.0013$, rel. error: $0.0013 / 3.1416 = 0.041\%$

Discussion and Comments:

The best of the above approximations is 22/7.

Note:

The homework should be send by e-mail (in plain text, LaTeX or MSWord) to
`roman.trobec@ijs.si`

After accepting, it will be published on the Class-web page:

http://www-e6.ijs.si/~roman/usalz/cmdie02_03/homeworks

with the file name equal to the last name and homework number (i.e.

`trobec_hw01.doc`)