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1 Introduction

Today I explained the function notation $s(t)$, see the solution of the quiz 1.

2 Problem 1

That is the problem 11 in the section 2.2 in the book.

$$g(x) = \frac{x-1}{x^3-1}$$

Estimate the limit:

$$\lim_{x \rightarrow 1} g(x)$$

We calculate the table:

x	0.2	0.4	0.6	0.8	0.9	0.99	1.8	1.6	1.4	1.2	1.1	1.01
g(x)	0.80	0.64	0.51	0.41	0.37	0.3367	0.16	0.19	0.22	0.27	0.30	0.3300

And we can

see, that for $x \rightarrow 1$, the $g(x)$ is approaching to something like 0.33, e.g. our guess would be that the limit is equal to $\frac{1}{3}$. We can also calculate that exactly:

$$\lim_{x \rightarrow 1} g(x) = \lim_{x \rightarrow 1} \frac{x-1}{(x-1)(x^2+x+1)} = \lim_{x \rightarrow 1} \frac{1}{x^2+x+1} = \frac{1}{3}$$

3 Problem 2

We did a problem 9, section 2.2. See the solution of the quiz 2 for a solution (just the numbers are different).

4 Problem 3

$$\lim_{x \rightarrow 2} \frac{x^2+x-6}{x-2} = \lim_{x \rightarrow 2} \frac{(x+3)(x-2)}{x-2} = \lim_{x \rightarrow 2} x+3 = 5$$