Math A Ø - 4 [illegible]

1 a) $a_n = \frac{n}{n+1}$ $a_1 = \frac{1}{2}$ $a_2 = \frac{2}{3}$ $a_3 = \frac{3}{4}$ $a_4 = \frac{4}{5}$

$a_{100} = \frac{100}{101}$

$\lim_{n\to\infty} = 1$

b) $a_n = \frac{n^2}{n+1}$ $a_1 = \frac{1}{2}$ $a_2 = \frac{4}{3}$ $a_3 = \frac{9}{4}$ $a_4 = \frac{16}{5}$

$a_{100} = \frac{10000}{101}$ $\lim_{n\to\infty} a_n = \infty$

c) $a_n = \frac{n}{n^2+1}$ $a_1 = \frac{1}{2}$ $a_2 = \frac{2}{5}$ $a_3 = \frac{3}{10}$ $a_4 = \frac{4}{17}$ $a_{100} = \frac{100}{10001}$

$\lim_{n\to\infty} a_n = 0$

2 a) $f(x) = \frac{1}{x^2-4}$ $x^2-4 \neq 0 \Rightarrow x^2 \neq 4$ $x \neq \pm 2$

$D_f \in \mathbb{R} \setminus 2 \wedge \setminus 2$ (alle $\mathbb{R}$ utenom 2 og -2)

b) $g(x) = \sqrt{9-|x-1|}$ ~~$\sqrt{9-1}$~~ ~~$9 \geq x-1$~~

$9-|x-1| \geq 0$

$9 \geq |x-1|$

$9 \geq x-1$

$10 \geq x$

$x \leq 10$

$x-1 \geq 0$

$x \geq 1$

$9 \geq -x+1$

$8 \geq -x$

$x \geq -8$

$x-1 < 0$

$x < 1$

$x \in [-8, 10]$

$D_f \in [-8, 10]$

3

$f(x) = \frac{10}{1+x^2}$

$x^2 \geq 0$, Verdier kun positive verdier ~~tatte~~

$10 \geq 0$

$1 > 0$

$y = f(x)$

$y = \frac{10}{1+x^2}$

$1+x^2 = \frac{10}{y}$

$x^2 = \frac{10}{y} - 1$

$x = \pm\sqrt{\frac{10}{y} - 1}$

$\frac{10}{y} - 1 \geq 0$

$\frac{10}{y} \geq 1$

$10 \geq y$

$y \leq 10$

~~Flordi~~

$\wedge \; y \geq 0 \; \wedge y \neq 0$

$V_f \in [0, 10]$

4

$h(x) \begin{cases} x^2, & x \geq 0 \\ -x^2, & x < 0 \end{cases}$

$h'(x) = \frac{2x}{-2x}$

$f(x) = 0$

$2x = 0$

$x = 0$

$y = x^2$

$x = \pm\sqrt{y}$

$y \in \geq 0$

$-x^2 = y$

$x = \pm\sqrt{-y}$

$y \leq 0$

V_f

$V_f \in \mathbb{R}$

$x^2 = y$, $x^2 \geq 0$

$x = \pm\sqrt{y}$ $\quad x^2 \geq 0$

$x = +\sqrt{y}$

$-x^2 = y$

$x = \pm\sqrt{y}$ $\quad -x^2 < 0$

$x = -\sqrt{y}$

får bare én x-verdi for alle y-verdier

$f^{-1}(x) = \begin{cases} \sqrt{x}, & x \geq 0 \\ -\sqrt{x}, & x < 0 \end{cases}$

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