b) $\lim\limits_{x\to\infty} \dfrac{3e^x - x^4}{\ln x - 2e^x} = \lim\limits_{x\to\infty} \dfrac{3 - \dfrac{x^4}{e^x}}{\dfrac{\ln}{e^x} - 2} = \dfrac{3-0}{0-2} = -\dfrac{3}{2}$

ty $x^4 \ll e^x$ och $\ln x \ll e^x$ då $x \to \infty$

4) $f(x) = x^2 e^{-x^2}$, $f'(x) = 2x\,e^{-x^2} + x^2 e^{-x^2}(-2x) =$

$= 2x(1-x^2)e^{-x^2} = 2x(1+x)(1-x)\underbrace{e^{-x^2}}_{>0}$

x	$(-\infty)$		-1		0		1		(∞)
$f'(x)$		$+$	0	$-$	0	$+$	0	$-$	
$f(x)$	(0)	$\nearrow$	e^{-1}	$\searrow$	0	$\nearrow$	e^{-1}	$\searrow$	(0)

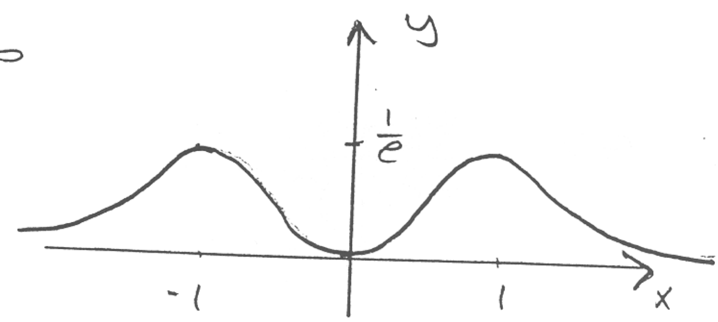
$f'(x) = 0 \Leftrightarrow x = 0, 1$ eller -1

ty $\lim\limits_{x\to\infty} f(x) = \lim\limits_{x\to\infty} \dfrac{x^2}{e^{x^2}} = 0$ $\quad (x^2 \ll e^{x^2})$

och pss då $x \to -\infty$

Svar $f_{max} = f(\pm 1) = \frac{1}{e}$,

$f_{min} = f(0) = 0$



5) $\int_0^1 \dfrac{x+5}{x^2+5x+6}\,dx = \int_0^1 \dfrac{x+5}{(x+2)(x+3)}\,dx = [\text{Handpåläggning}]$

$= \int_0^1 \dfrac{3}{x+2} - \dfrac{2}{x+3}\,dx = \Big[3\ln|x+2| - 2\ln|x+3|\Big]_0^1 =$

$= (3\ln 3 - 2\ln 4) - (3\ln 2 - 2\ln 3) =$

$= 5\ln 3 - 4\ln 2 - 3\ln 2 = \underline{\underline{5\ln 3 - 7\ln 2}}$

Så $\int \dots dx = 3\ln|x+2| - 2\ln|x+3| + C$