Oppgave 7

b) $f'(x) = 2\cos(x) - (\cos(x) - x\sin(x)) - 7$

$f'(x) = 2\cos(x) - \cos(x) + x\sin(x) - 7$

$= \cos(x) + x\sin(x) - 7$

$f''(x) = -\sin(x) + (\sin(x) + x\cos(x))$

$f''(x) = \underline{\underline{+x\cos(x)}}$

c) Siden $x \in [1, 3]$ vil $|K| \geq |\cos(1)|$

eller $|K| \geq |3\cos(3)|$:

$|3\cos(3)| \leq |K| \Rightarrow |-2,97| \leq |K| \Rightarrow |K| \geq 2,97$

$|\cos(1)| \leq |K| \Rightarrow |0,54| \leq |K| \Rightarrow |K| \geq 0,54$

K er dertor større eller lik $\underline{\underline{2.97}}$

d) $\left| \int_1^3 f(x)dx - M_4 \right| \leq \frac{K(b-a)^3}{24n^2}$

$\Downarrow$

$\left| \int_1^3 f(x)dx - 5 \right| \leq \frac{2.97(3-1)^2}{24 \cdot 4^2} = \underline{\underline{\frac{99}{1600}}}$

e) $\frac{K(3-1)^2}{24n^2} = \frac{1}{100}$

$4K = \frac{24n^2}{100}$

$400K = 24n^2$

$n^2 = \frac{50K}{3}$, setter $K = 2,97$

$n = \frac{\sqrt{50 \cdot 2,97}}{3} = 7,03.$

Må ta 8 steg for å være sikker på en Feil $\leq \frac{1}{100}$