

11.21

lördag 7 januari 2023

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$$a) \lim_{x \rightarrow 0} \frac{e^x - 1 - x}{x^2} = \lim_{x \rightarrow 0} \frac{\cancel{1} + \cancel{x} + \frac{1}{2}x^2 + x^3 B(x) - \cancel{1} - \cancel{x}}{x^2} = \lim_{x \rightarrow 0} \frac{\cancel{x^2} (\frac{1}{2} + x B(x))}{\cancel{x^2}} = \underline{\underline{\frac{1}{2}}} \text{ då } x \rightarrow 0$$

$$e^x = 1 + x + \frac{1}{2}x^2 + x^3 B(x)$$

$$b) \lim_{x \rightarrow 0} \frac{x^3}{\sin 2x - 2x} = \lim_{x \rightarrow 0} \frac{x^3}{\cancel{2x} - \frac{4x^3}{3} + x^5 B(x) - \cancel{2x}} = \lim_{x \rightarrow 0} \frac{\cancel{x^3}}{\cancel{x^3} (-\frac{4}{3} + x^2 B(x))} = \lim_{x \rightarrow 0} \frac{1}{-\frac{4}{3} + 0} = \underline{\underline{-\frac{3}{4}}} \text{ då } x \rightarrow 0$$

$$\sin t = 0 + t - \frac{t^3}{6} + x^5 B(x)$$

$$\sin 2x = 2x - \frac{2 \cdot 4x^3}{6} = 2x - \frac{4x^3}{3} + x^5 B(x)$$