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1)

a) $\lim_{x \to 0} \frac{\text{sen } 2x}{x} = 2x = t \quad \frac{\text{sen } t}{t} = 1 \quad 2.1 = 2$

b) $\lim_{x \to 0} \frac{\text{sen } 3x}{5x} = \frac{3\cos(3x)}{5} = \frac{3\cos(0)}{5} = \frac{3}{5}$

c) $\lim_{x \to 0} \frac{\text{sen } 3x}{\text{sen } 2x} = \frac{\text{sen}(3x)}{\text{sen}(2x)} \cdot \frac{3 . 2x}{2 . 2x} = \frac{3}{2} \cdot \frac{\text{sen}(3x)}{3x} \cdot \frac{2x}{\text{sen}(2x)}$

$\frac{3}{2} . 1 . 1^{-1} = \frac{3}{2}$

d) $\lim_{x \to 0} \frac{tg\, x}{x} = \frac{\frac{\text{sen} x}{\cos x}}{x} = \frac{\text{sen} x}{\cos x \; x} = \frac{1}{\cos x} \cdot \frac{\text{sen} x}{x} = 1$

e) $\lim_{x \to 0} \frac{\cos x - 1}{x} = \frac{\cos x - 1}{x} = \frac{\cos x^2 - 1}{x . \cos x + 1} = \frac{(1 - \cos x^2)}{x . \cos x}$

$\frac{-\text{sen}(x)^2}{x \cdot (\cos(x) + 1)} = \frac{-\text{sen}(x)}{x} \cdot \frac{1}{\cos x + 1} = 1.0 = 0$

f) $\lim_{x \to 0} \frac{\text{sen } 3x}{x} = 3x = t = 3 . \frac{\text{sen } t}{t} = 3.1 = 3$

g) $\lim_{x \to 0} \frac{tg\, 2x}{x} = \frac{\frac{\text{sen}(2x)}{\cos(2x)}}{x} \quad \frac{\text{sen } 2x}{\cos(2x).x} = \frac{1}{\cos(2x)} \cdot \frac{\text{sen } 2x}{x}$

$\frac{1}{\cos(x)} . 2 = 1.2 = 2$

H) $\lim_{x \to 0} \frac{tg\,5x}{tg\,x} = 5$

i) $\lim_{x \to 0} \frac{sen^2 x}{x} = \frac{sen\,x \cdot sen\,x}{x} = sen\,x \cdot \frac{sen\,x}{x} = 0 \cdot 1 = 0$

j) $\lim_{x \to 0} \frac{sen\,x}{tg\,2x} = \frac{cos\,x}{2 sec(2x)^2} = \frac{cos(0)}{2\,sec(2 \cdot 0)^2} = \frac{1}{2}$

2)

a) $\lim_{x \to +\infty} \left(1+\frac{1}{x}\right)^{2x} = \left[\left(1+\frac{1}{x}\right)^x\right]^2 = e^2$

b) $\lim_{x \to +\infty} \left(1+\frac{2}{x}\right)^x = \left(1+\frac{2}{2t}\right)^{2t} = \left(1+\frac{1}{t}\right)^2 = e^2$

c) $\lim_{x \to +\infty} \left(1+\frac{2}{x}\right)^{3x} = \left(1+\frac{2}{2t}\right)^{3 \cdot 2t} = \left(1+\frac{1}{t}\right)^6 = e^6$

d) $\lim_{x \to -\infty} \left(1-\frac{2}{x}\right)^{3x} = \left(1-\frac{2}{2t}\right)^{3 \cdot -2t} = e^{-6}$

e) $\lim_{x \to 0} (1+4x)^{1/x} = \left[(1+t)^{\frac{1}{t}}\right]^{-4} = e^4$

f) $\lim_{x \to 0} (1-3x)^{\frac{2}{x}} = \left[(1-t)^{\frac{2}{t}}\right]^{-6} = e^{-6}$

g) $\lim_{x \to +\infty} \left(\frac{x-4}{x-1}\right)^{x+3} =$

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H) $\lim\limits_{x \to +\infty} \left(\frac{2x+3}{2x+1}\right)^{x} = \left(1+\frac{1}{H}\right)^{-3H+4} = -3 \cdot \frac{-4}{3} \lim\left(1-\frac{3}{3H}\right) =$

$\frac{-12}{3}$

i) $\lim\limits_{x \to 0} \frac{\ln(1+x)}{2x} = \left(\frac{\ln(1+x)}{x}\right) = \frac{1}{2} \cdot 1 = \frac{1}{2}$

j) $\lim\limits_{x \to 0} \frac{\ln(1+2x)}{3x} = \frac{\frac{2}{1+2x}}{3} = \frac{2}{1+2x \cdot 3x} = \frac{2}{3(1+2x)} = \frac{2}{3}$