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$$\lim_{x\to 0} (1-\cos 3x)\log\left(\sqrt[5]{1+2x}-1\right) =$$

$$= \lim_{x\to 0} (1-\cos 3x)\log\left(2x\,\frac{\sqrt[5]{1+2x}-1}{2x}\right) =$$

$$= \lim_{x\to 0} 3\frac{1-\cos 3x}{3x}\left(\frac{1}{2}2x\log 2x + x\log\frac{\sqrt[5]{1+2x}-1}{2x}\right) =$$

$$= 3\cdot 0\left(\frac{1}{2}0 + 0\log\frac{1}{5}\right) = 0$$

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$$\lim_{x\to+\infty} \frac{x^2+3x+1}{x^3+4}\log\frac{x-2}{x^2+3} =$$

$$= \lim_{x\to+\infty} \frac{x^2+3x+1}{x^3+4}\log\frac{x-2}{x+\frac{3}{x}}\cdot\frac{1}{x} =$$

$$= \lim_{x\to+\infty} \frac{x^2+3x+1}{x^3+4}\cdot\frac{x^2+3}{x-2}\cdot\frac{x-2}{x^2+3}\log\frac{x-2}{x^2+3} =$$

$$= \lim_{x\to+\infty} \frac{x^4+3x^3+4x^2+9x+3}{x^4-2x^3+4x-8}\cdot\lim_{y\to 0} y\log y =$$

$$y = \frac{x-2}{x^2+3}$$

$$= 1\cdot 0 = 0$$