Answer to Question #87288 – Math – Calculus

Question

1. Evaluate the limit

$$lim_{x\to\infty}\frac{6e^{4x}-e^{-2x}}{8e^{4x}-e^{2x}+3e^{-x}}$$

Solution

$$lim_{x\to\infty}\frac{6e^{4x}-e^{-2x}}{8e^{4x}-e^{2x}+3e^{-x}}=lim_{x\to\infty}\frac{e^{4x}(6-e^{-6x})}{e^{4x}(8-e^{-2x}+3e^{-5x})}=lim_{x\to\infty}\frac{(6-e^{-6x})}{(8-e^{-2x}+3e^{-5x})}=\frac{6}{8}=\frac{3}{4}$$

Note: $\lim\limits_{x\to\infty} e^{-ax}=0, a>0.$