d) $\lim\limits_{x\to\infty}\left(1+\frac{a}{x}\right)^x = \lim\limits_{x\to\infty} f(x) \quad \Big| \ln[f(x)] = x\ln\left(1+\frac{a}{x}\right)$

$\lim\limits_{x\to\infty} \ln[f(x)] = \lim\limits_{x\to\infty} \dfrac{\ln\left(1+\frac{a}{x}\right)}{\frac{1}{x}} = \dfrac{\lim\limits_{x\to\infty} \frac{1}{1+\frac{a}{x}} \cdot \left(\frac{-a}{x^2}\right)}{\frac{-1}{x^2}} = a$

$\lim\limits_{x\to\infty} f(x) = \lim\limits_{x\to\infty} e^{\ln[f(x)]} = e^a$

e) $\lim\limits_{x\to 1} x^{\frac{1}{x-1}} \quad \Big| \ln[f(x)] = \frac{1}{x-1}\ln(x)$

$\lim\limits_{x\to 1} \dfrac{\ln(x)}{x-1} = \lim\limits_{x\to 1} \dfrac{\frac{1}{x}}{1} = 1$

$\lim\limits_{x\to 1} e^{\ln[f(x)]} = e^1 = e$