8. $\lim_{x\to 2} \frac{x^2+x-6}{x-2} \quad \frac{2x+1}{1} = 5$

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

10: $\frac{\sin 4x}{\frac{\sin 5x}{\cos 5x}} \quad \frac{\cos 5x \cdot \sin 4x}{\sin 5x} = \lim_{x\to 0} \cos 5x \cdot \lim_{x\to 0} \frac{\sin 4x}{\sin 5x}$

$= \frac{4}{5}$

13. $\lim_{v\to 0} \frac{e^{2v}-1}{\sin v} = \frac{2e^{2v}}{\cos v} = \frac{2e^{2v}}{1} = 2$

24. $\lim_{v\to\infty} \frac{e^{v/10}}{v^3} \quad \frac{\frac{1}{10}e^{\frac{v}{10}}}{3v^2} \quad \frac{\frac{1}{100}e^{\frac{v}{10}}}{6v} \quad \frac{\frac{1}{1000}e^{\frac{v}{10}}}{6} = \infty$

29. $\lim_{x\to 0} \frac{\arcsin x}{x} = \frac{\frac{1}{\sqrt{1-x^2}}}{1} = \frac{1}{\sqrt{1}} = 1$

30. $\lim_{x\to\infty} \frac{(\ln x)^2}{x} = \frac{2\cdot \ln(x)\cdot \frac{1}{x}}{1} = \frac{2\ln(x)}{x} = \frac{2}{x}$

$= 0$

42. $\lim_{x\to\infty} \sqrt{x}\, e^{\frac{-x}{2}} = \lim_{x\to\infty} \frac{\sqrt{x}}{e^{x/2}} = \frac{2x^{-.5}}{\frac{1}{2} e^{x/2}} = \frac{2}{\sqrt{x}\cdot e^{x/2}}$

$= 0$

44. $\lim_{x\to 0^+} \sin x \cdot \ln x = \frac{\sin x}{x} =$

$\frac{\ln x}{\csc x} = \frac{1}{x\cdot -\csc x \cdot \cot x} - \frac{\sin x \cdot \sin x}{x \cos x} =$

$\lim_{x\to 0} -\frac{\sin^2 x}{\cos x} \cdot \lim_{x\to 0} \frac{1}{x}$

$-\frac{0}{1} \cdot \frac{0}{1} = \frac{0}{1} = 0$

46. $\lim_{x\to\infty} x^3 \cdot e^{-x^2} = \frac{x^3}{e^{x^2}} \quad \frac{3x^2}{e^{x^2}\cdot 2x} = \frac{1.5x}{e^{x^2}} = \frac{1}{e^{x^2}\cdot 2x} = \frac{1}{\infty} = 0$

58.

$y = \left(1 + \frac{a}{x}\right)^{bx}$

$\ln y = bx \ln\left(1 + \frac{a}{x}\right) = b \cdot \frac{\ln\left(1 + \frac{a}{x}\right)}{\frac{1}{x}} = \frac{\frac{1}{\ln(1+\frac{a}{x})}}{\frac{1}{x^2}}$

$= \frac{1}{\ln(1+\frac{a}{x})} \cdot a \cdot b$

$= a \cdot b = \ln(y)$

$e^{a \cdot b}$

50. $\lim_{x\to 1^+} x^{\frac{1}{(1-x)}} \quad y = x^{\frac{1}{1-x}}$

$= e^{-1} \quad \ln y = \frac{\ln x}{1-x} \quad \frac{1}{x\cdot -1} = \ln y \quad e^{-x^{-1}} =$