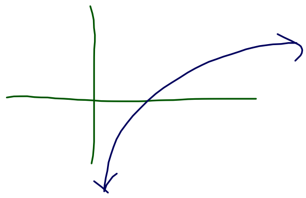
$$\frac{\infty}{\infty} \quad \text{or} \quad \frac{0}{0}$$

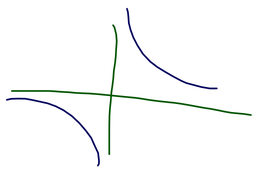
$$\infty \cdot 0, \quad \infty - \infty, \quad 1^{\infty}, \quad 0^{0}, \quad \infty^{0}$$

17

$$\lim_{x \to 0^+} x \ln x = 0 \cdot -\infty$$



$$\lim_{x \to 0^+} \frac{\ln x}{\frac{1}{x}} \quad \frac{-\infty}{\infty}$$



L'Hopital's

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

(19) $\lim_{x \to 0^+} \left(\csc x - \cot x + \cos x \right)$

$\lim_{x \to 0^+} \left(\frac{1}{\sin x} - \frac{\cos x}{\sin x} + \frac{\sin x \cos x}{\sin x} \right)$

$1 - 1 + 0(1)$

$\lim_{x \to 0^+} \frac{1 - \cos x + \sin x \cos x}{\sin x} = \frac{0}{0}$

L'Hop.

$\lim_{x \to 0^+} \frac{\sin x + (\cos x \cos x + \sin x(-\sin x))}{\cos x}$

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

21) $\lim_{x\to 0} (e^x + x)^{\frac{1}{x}}$

$(e^0 + 0)^{\frac{1}{0}}$ 1^{∞}

$f(x) = (e^x + x)^{\frac{1}{x}}$

$\ln f(x) = \frac{1}{x} \ln(e^x + x)$

$\lim_{x\to 0} \frac{1}{x} \ln(e^x + x)$

$\lim_{x\to 0} \frac{\ln(e^x + x)}{x}$ $\frac{0}{0}$

L'Hopital

$\lim_{x\to 0} \frac{\frac{1}{e^x + x} \cdot e^x + 1}{1}$

$\lim_{x\to 0} \frac{e^x + 1}{e^x + x}$ $\frac{2}{1} = 2$

$\ln f(x) = 2$

$e^{\ln f(x)} = e^2$

$f(x) = e^2$

33 $\lim_{\theta \to 0} \frac{\sin(\theta^2)}{\theta}$ $\frac{0}{0}$

L'Hop.

$\lim_{\theta \to 0} \frac{\cos(\theta^2) \cdot 2\theta}{1} = 0$

38 $\lim_{x \to 0^+} \left(\ln x - \ln(\sin x)\right)$ $\infty - \infty$

$\lim_{x \to 0^+} \ln\left(\frac{x}{\sin x}\right)$

L'Hop. $f(x) = \frac{x}{\sin x}$

$\lim_{x \to 0^+} \frac{1}{\cos x} = 1$

$\ln(1) = 0$

24, 26, (32 - 48) evens

(64 - 67)