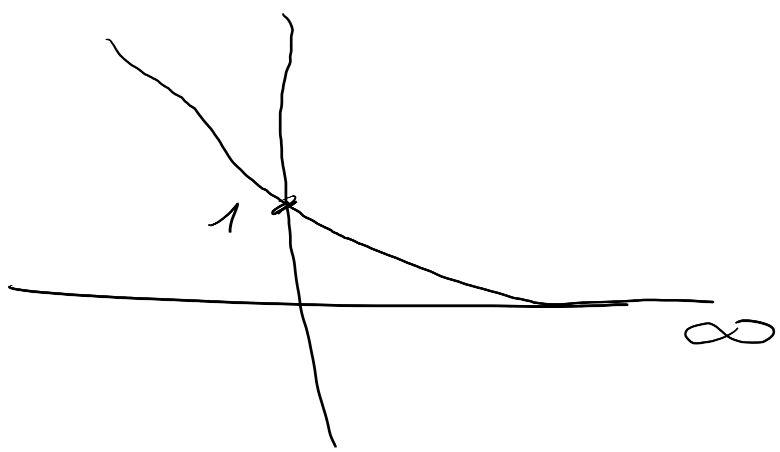
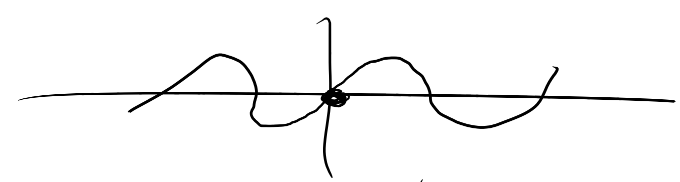
$$\lim_{x\to 2} e^{2x-3} + \ln(x^2) - x =$$

$$e^{2\cdot 2-3} + \ln(2^2) - 2 = e + \ln 4 - 2$$

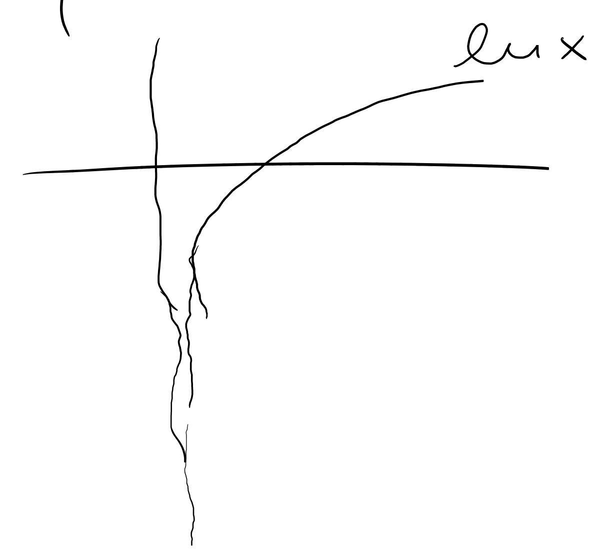
$$\lim_{x\to\infty} \frac{e^{-x}}{x^2+x} = \frac{0}{\infty+\infty} = \frac{0}{\infty} = 0$$



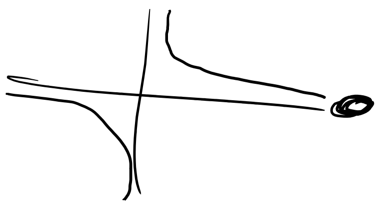
$$\frac{5}{\infty} = 0$$



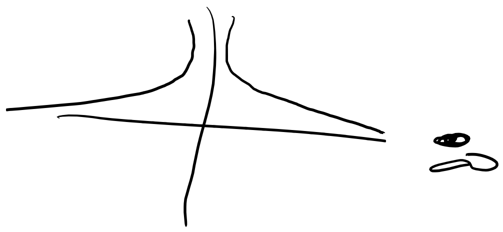
$$\lim_{x\to 0+} \frac{-\sin x}{\ln x} = \frac{-0}{-\infty} = 0$$



$$\lim_{x\to\infty} \frac{x^3 - x^2}{-4x^3 + 7x} = \lim_{x\to\infty} \cancel{\frac{x^3}{x^3}} \cdot \frac{1 - \underbrace{\frac{1}{x}}_{\to 0}}{-4 + \underbrace{\frac{7}{x^2}}_{\to 0}}$$



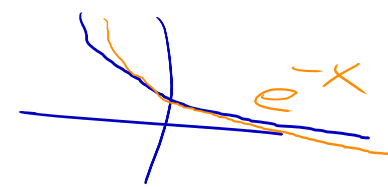
$$= \frac{1-0}{-4+0} = -\frac{1}{4}$$



$$\lim_{x\to\infty} \frac{\frac{1}{x} + e^x + (\ln x)^2}{3^x + x^7 - \frac{2}{x}} = \cancel{\lim_{x\to\infty} \frac{e^x}{3^x} \cdot \frac{\frac{1}{x} \cdot e^x + 1(\ldots)}{}}$$

$0 \cdot 0$

$$= \lim_{x\to\infty} \underbrace{\frac{e^x}{3^x}}_{\to 0} \cdot \frac{\frac{1}{x} e^{-x} + 1 + \underbrace{(\ln x)^2}_{\to\infty} \cdot \underbrace{e^{-x}}_{\to 0}}{1 + \frac{x^7}{3^x} - \underbrace{\frac{2}{x}}_{\to 0} \cdot \underbrace{3^{-x}}_{\to 0}}$$



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

$$\frac{e^x}{3^x} = \left(\frac{e}{3}\right)^x \qquad e = 2{,}71 \qquad \frac{e}{3} < 1$$

$2^x \to \infty$

$\left(\frac{1}{2}\right)^x \to 0$

$$\frac{(\ln x)^2}{e^x}$$

$$\underset{\substack{\downarrow\\ -0}}{-\frac{1}{x}} \le \underset{\substack{\downarrow\\ 0}}{\frac{\sin x}{x}} \le \underset{\substack{\downarrow\\ 0}}{\frac{1}{x}}$$

$$\lim_{x\to\infty} \frac{\sin x}{x} = 0$$

$$\underset{\substack{\downarrow\\ 0}}{\frac{1}{x}} \cdot \underset{\text{bound}}{\sin x} \qquad \frac{\sin x}{x} \to 0$$

$$\underset{\substack{\downarrow\\ 0}}{f} \cdot \underset{\text{bounded}}{g} \qquad fg \to 0$$

$(\sin x, \cos x \ldots)$

$$\lim_{x\to\infty} \frac{-2x^3+3}{3x^2+1} = \lim_{x\to\infty} \underbrace{\frac{x^3}{x^2}}_{x} \cdot \frac{-2+3/x^3}{3+1/x^2}$$

$$\infty \cdot \frac{-2+0}{3+0} =$$

$$= \infty \cdot \frac{-2}{3} = -\infty$$

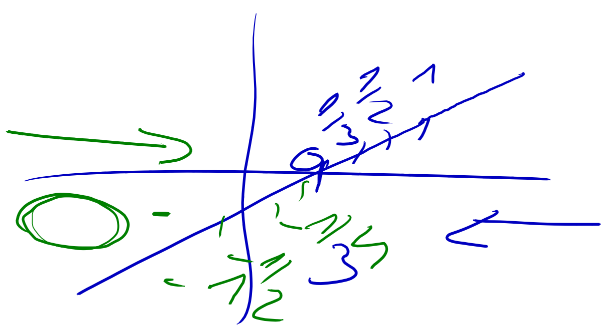
$$\lim_{x\to 3} \frac{x^2-5x+6}{x^2-6x+9} \qquad \frac{9-15+6}{9-18+9} = \frac{0}{0}$$

$$\lim_{x\to 3} \frac{\cancel{(x-3)}(x-2)}{\cancel{(x-3)}(x-3)} = \lim_{x\to 3} \frac{\overset{1}{x-2}}{x-3} \qquad ¿\,\frac{3-2}{0}\,?$$

$3-2=1$

$$\lim_{x\to 3^-} \underbrace{\frac{1}{x-3}}_{\frac{1}{0^-}}\cdot(x-2) = -\infty\cdot 1 = -\infty$$

$$\lim_{x\to 3^+} \underbrace{\frac{1}{x-3}}_{\frac{1}{0^+}}\cdot(x-2) = +\infty\cdot 1 = \infty$$



$$\lim_{x\to 3} \quad \nexists$$