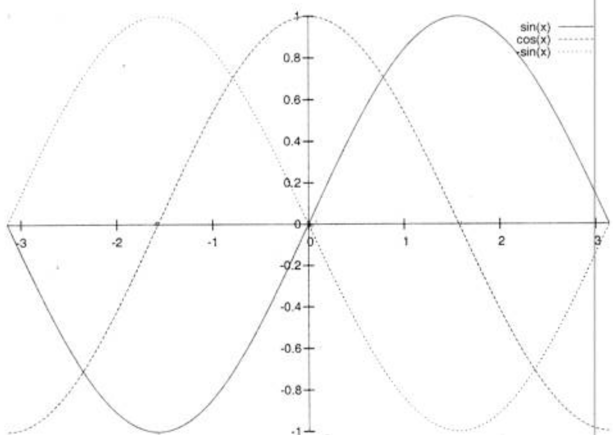
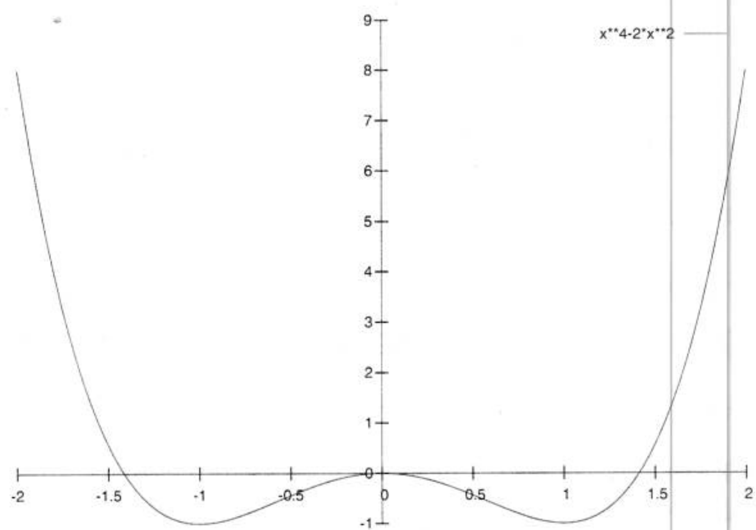
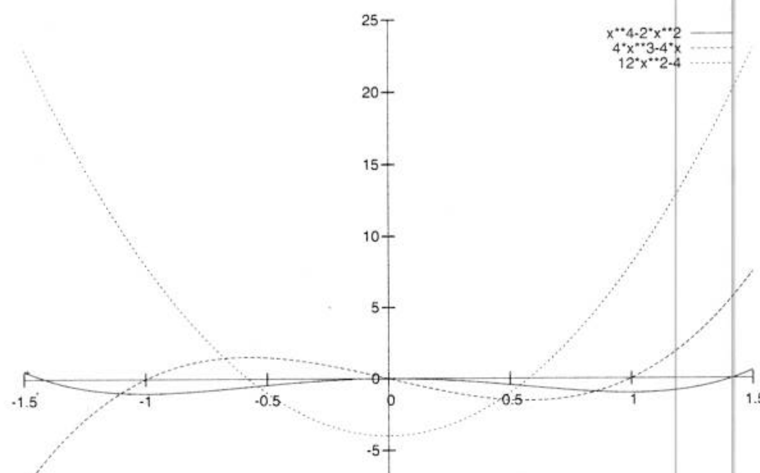

sin(x)
cos(x)
-sin(x)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-3
-2
-1
0
1
2
3



x**4-2*x**2



x**4-2*x**2
4*x**3-4*x
12*x**2-4

One-sided limits, $\lim_{x\to a^+}$ or $\lim_{x\to a^-}$, are also allowed.

Moreover, we have the same result if $\lim_{x\to a} f(x)$ and $\lim_{x\to a} g(x)$ are both $\pm\infty$ [even if one is $+\infty$ and the other $-\infty$], rather than both being 0.

[To see that it works for infinite limits: consider $\frac{1}{f(x)}$ and $\frac{1}{g(x)}$, which both tend to 0 at a]

Examples:

- $\lim_{x\to 0} \frac{\sin(x)}{x^2-4x} = \lim_{x\to 0} \frac{\cos(x)}{2x-4} = -\frac{1}{4}$.
- $\lim_{x\to 1} \frac{x^2-1}{x-1} = \lim_{x\to 1} \frac{2x}{1} = 2$
- $\lim_{x\to +\infty} \frac{e^x}{x} = \lim_{x\to +\infty} \frac{e^x}{1} = +\infty$
- $\lim_{x\to +\infty} \frac{e^x}{x^2} = \lim_{x\to +\infty} \frac{e^x}{2x} = \lim_{x\to +\infty} \frac{e^x}{2} = +\infty$
-

$$\begin{aligned}\lim_{x\to 0^+} x\ln x &= \lim_{x\to 0^+} \frac{\ln x}{\frac{1}{x}} \\ &= \lim_{x\to 0^+} \frac{\frac{d}{dx}\ln x}{\frac{d}{dx}\frac{1}{x}} \\ &= \lim_{x\to 0^+} \frac{\frac{1}{x}}{\frac{-1}{x^2}} \\ &= \lim_{x\to 0^+} -x \\ &= 0\end{aligned}$$

Sketching curves

Examples.