

$$\begin{aligned} (x^x)' &= (e^{\ln x^x})' = \\ &= (e^{x \cdot \ln x})' = \underbrace{e^{x \cdot \ln x}}_{=x^x} \cdot (x \cdot \ln x)' = \dots \end{aligned}$$

$$D(f) = [0, \infty)$$

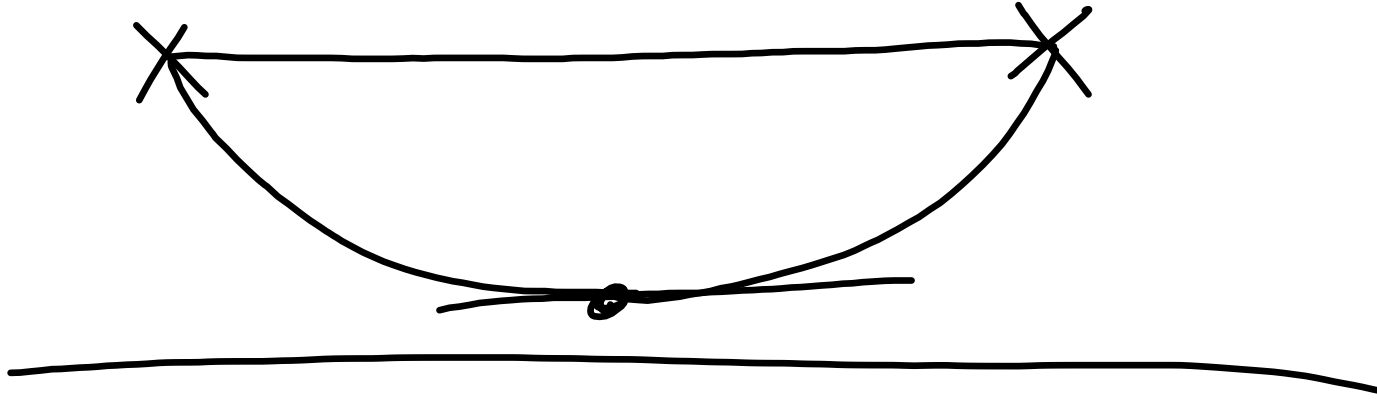
$$f(x) = \sqrt{x} = x^{\frac{1}{2}}$$

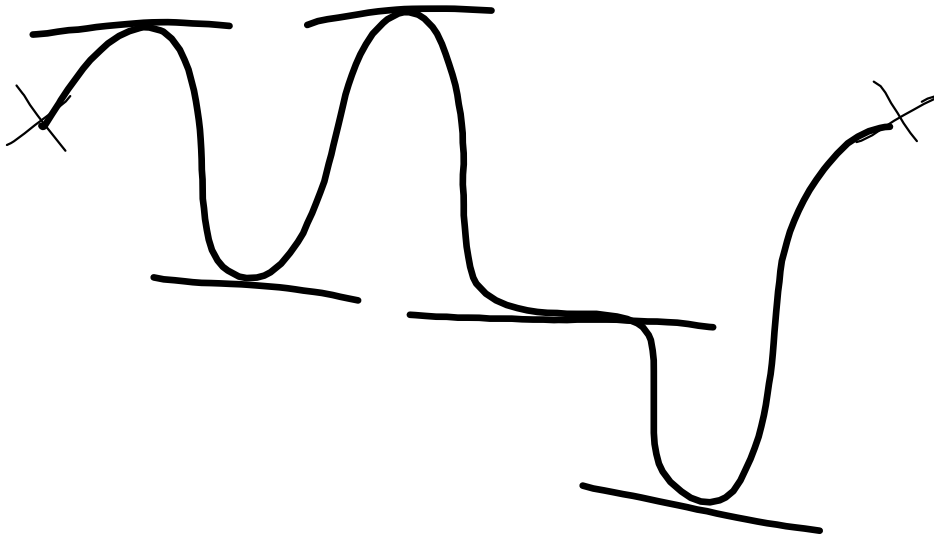
$$D(f') = (0, \infty)$$

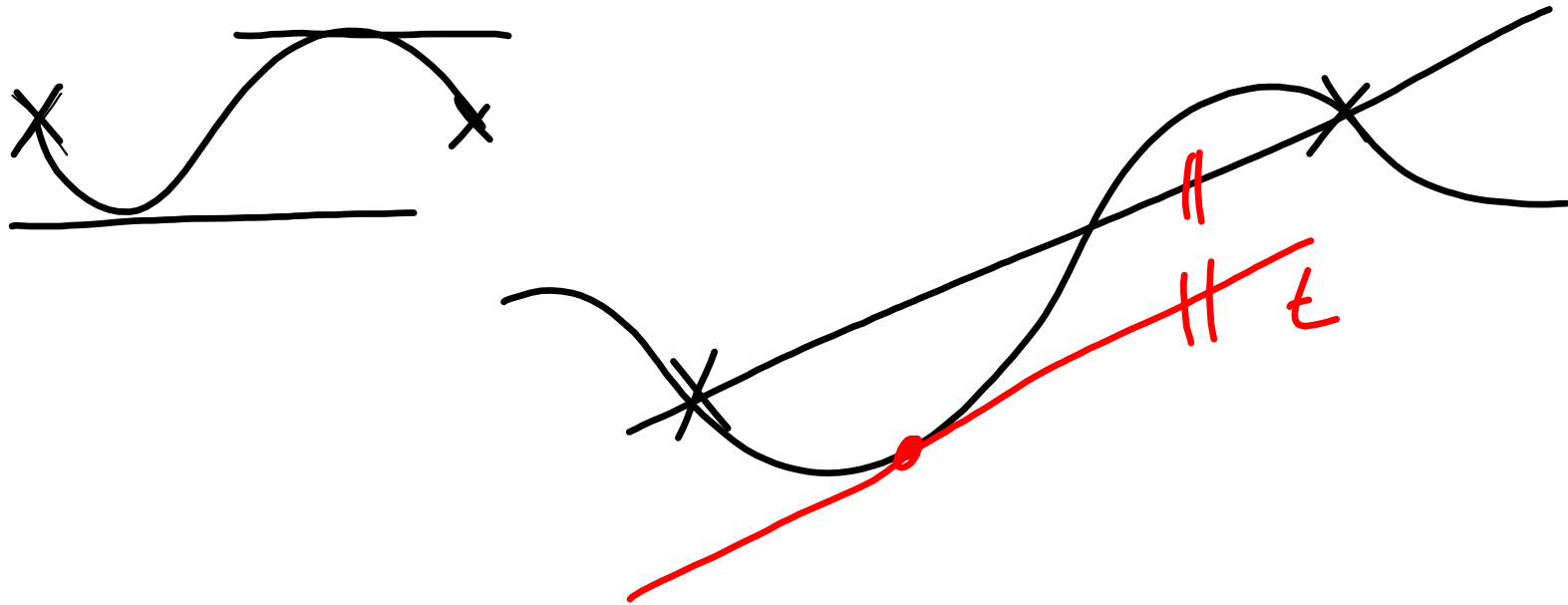
$$f'(x) = \frac{1}{2} \cdot x^{-\frac{1}{2}} = \frac{1}{2 \cdot \sqrt{x}}$$

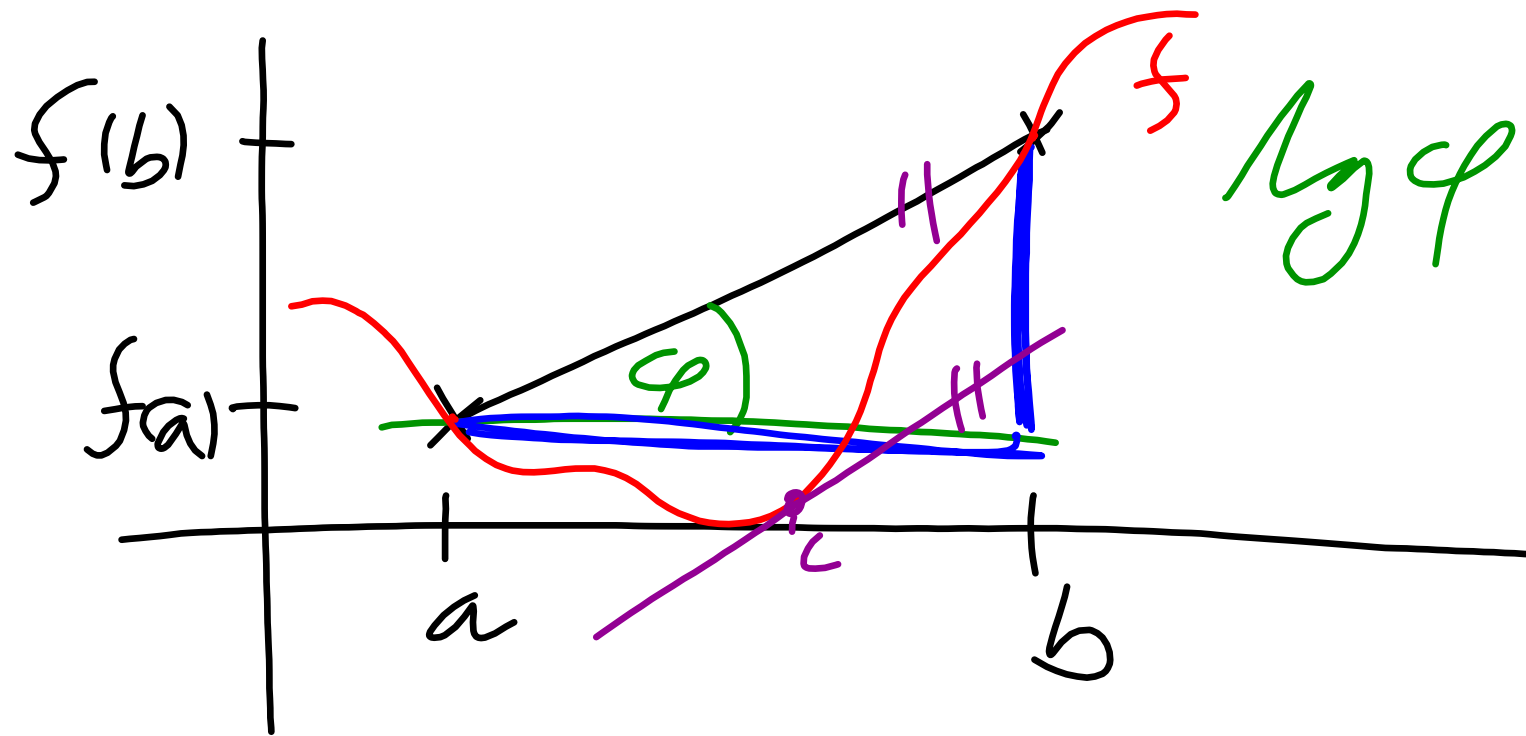


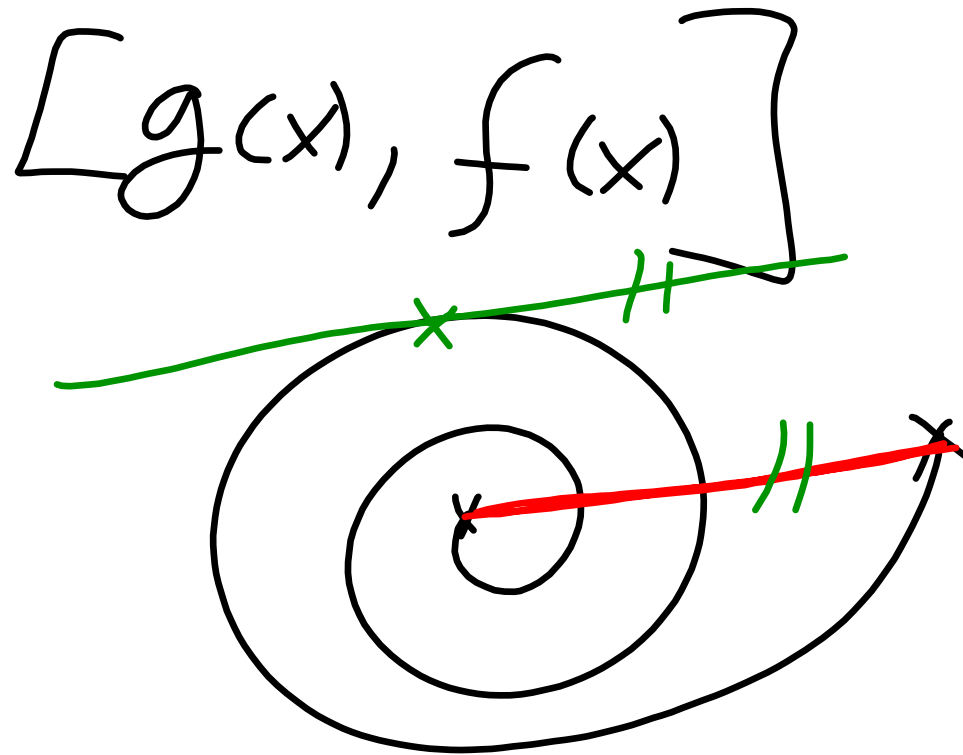
$$\frac{d^2 f}{dx^2}$$









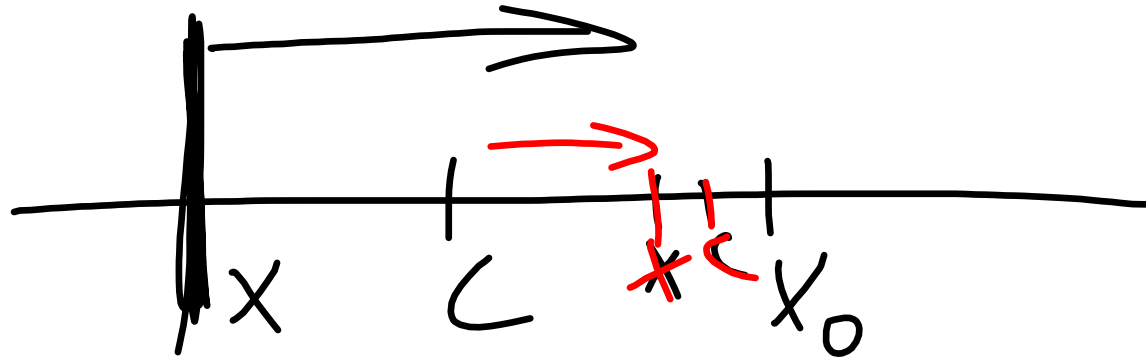
 $[g(x), f(x)]$

$$X = 1, \dots, 5$$
$$X \in [1, 5)$$

$$g(x) = x$$

$$f(g(x))$$

$$g'(x) = 1$$



$$\left(\frac{1}{f}\right)' = \left(f^{-1}\right)' = -1 \cdot f^{-2} \cdot f'$$

$$f \cdot g = |0 \cdot \infty| = \frac{f}{\frac{1}{g}} = \frac{0}{\frac{1}{\infty}}$$
$$= \frac{g}{\frac{1}{f}} = \frac{\infty}{\frac{1}{0}}$$

Handwritten annotations in red: arrows point from the red '0' to the 'f' in the first fraction, and from the red '∞' to the 'g' in the first fraction. In the second fraction, the red '∞' is in the numerator and the red '0' is in the denominator, both circled in red.

$$\lim f^g = \lim C^{h f^g} = C$$

$h g \cdot h f$

$$\begin{array}{c}
 f - g \\
 \downarrow \quad \downarrow \\
 \infty - \infty
 \end{array}
 = \frac{1}{\frac{1}{f}} - \frac{1}{\frac{1}{g}}
 = \frac{\frac{1}{g} - \frac{1}{f}}{\frac{1}{f \cdot g}}$$

The expression $\frac{1}{g} - \frac{1}{f}$ is circled in red, with a red arrow pointing to a red '0' above it. The expression $\frac{1}{f \cdot g}$ is circled in red, with a red arrow pointing to a red '0' below it. The entire fraction is circled in yellow.

