

**Problem statement** Suppose  $f(x) = x^{\left(\frac{1}{10}\right)}$ ,  $g(x) = e^{\left(\frac{x}{100}\right)}$ , and  $h(x) = \ln x$ .

- a) Find an interval of positive numbers where the graph of  $f$  is above the graph of both  $g$  and  $h$ .
- b) Find an interval of positive numbers where the graph of  $g$  is above the graph of both  $f$  and  $h$ .
- c) Find an interval of positive numbers where the graph of  $h$  is above the graph of both  $f$  and  $g$ .
- d) Suppose we consider a very short interval of positive numbers very close to 0, such as  $[10^{-10}, 2 \cdot 10^{-10}]$ . Which graph will be on top? Which graph will be on the bottom?
- e) Suppose we consider an interval of positive numbers which are very large, such as  $[10^{100}, 2 \cdot 10^{100}]$ . Which graph will be on top? Which graph will be on the bottom?