Problem statement If f is a function, then a number x_0 is called a *fixed point* of f exactly when $f(x_0) = x_0$.

a) Find all the fixed points of the following functions to three-place accuracy.

$$f(x) = x^2 \qquad g(x) = 3e^x - 2e^{-x} \qquad h(x) = \frac{2}{3}\arctan x.$$

b) Illustrate your answers graphically. Give three graphs, each one showing x, one of the functions above, and any fixed points.

c) Suppose that f is a differentiable function and $f'(x) < 1$ for all x. Use the MVT to explain why f can have no more than one fixed point. To which of the functions in a) does this general statement apply?