5.

$$F(x) = 2x, \qquad G(y) = 3y \qquad \text{on} \quad [0, \infty).$$

h is a conjugacy between f and G if

$$G \circ h(x) = h \circ f(x)$$
$$\Rightarrow \quad 3h(x) = h(2x).$$

Hence one requirement is $3h(0) = h(0)$
$$\Rightarrow \quad h(0) = 0.$$

Try $h(x) = x^{\alpha}$ where α is to be determined.
Then

$$3h(x) = h(2x)$$
$$\Rightarrow \quad 3x^{\alpha} = 2^{\alpha}x^{\alpha}$$
$$\Rightarrow \quad 3 = 2^{\alpha}$$
$$\Rightarrow \quad \alpha = \frac{\log 3}{\log 2}.$$

So $h(x) = x^{\frac{\log 3}{\log 2}}$ works

Clearly $h(x)$ and $h^{-1}(y)$ are continuous on $[0, \infty)$
So h is a homeomorphism as required.

However $h^{-1}(y) = y^{\frac{\log 2}{\log 3}}$ is not differentiable at $y = 0$ since $\frac{\log 2}{\log 3} < 1$.

Hence h is not a diffeomorphism.