Let P be the set of all power function with rational exponents, $\{y = x^a, a \in \mathbb{Q}\}$.

Three elements of this set would be $f(x) = x^5,\ g(x) = x^{\frac{2}{3}},\ h(x) = x^{-2}$

1. Using the elements above determine whether the operation of composition is commutative for this set.

2. Using the elements above determine whether the operation of composition is associative for this set.

3. What is the identity for composition? Can it be represented as an element of this set?

4. Does each of the three elements have an inverse that is in this set?

5. Do you see any obstacles to forming a group with this set?