Defining General Power Functions: You should know how to define $x^a$ for positive values of $x$ using the exponential function and the natural logarithmic function. You should know how to define $0^a$ for various values of $a$. Given the function $x^a$, you should know how to figure out when $x^a$ is defined for negative value of $x$ based on the value of $a$.

Differentiating General Power Functions: Given a power function, you should be able to find the derivative of that function where the derivative is defined. Given $x^a$, you should know how to determine whether or not $x^a$ is differentiable at 0 based on the value of $a$. You should be able to differentiate compositions of function involving any power function using the Chain Rule, and you should be able to determine the domain of that composition.

Lecture Notes for Week 10: Lecture 23

Homework for Week 9: Homework 19