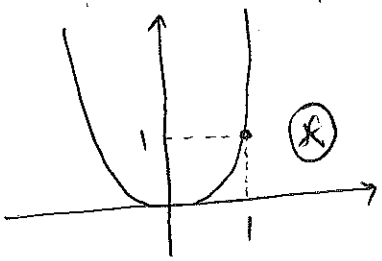
4.1.4 Graphs of power functions x^a

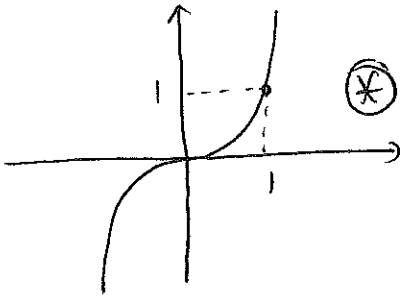
The overall shape of the graph of a power function depends on the sign and value of the exponent...

Case 1 $a > 1$

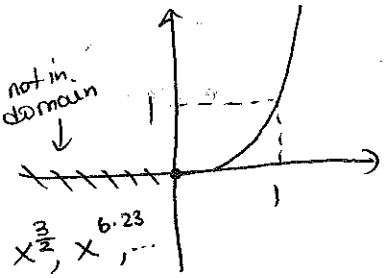
If a is integer and even $(x^2, x^4, \ldots)$



If a is integer and odd $(x^3, x^5, \ldots)$

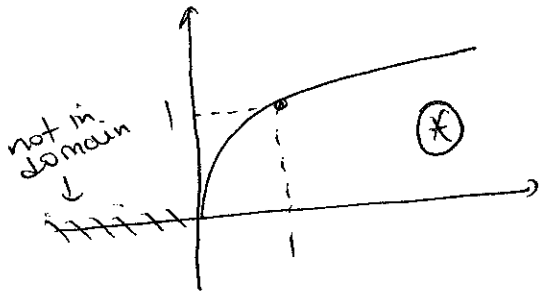


If a not integer, typically

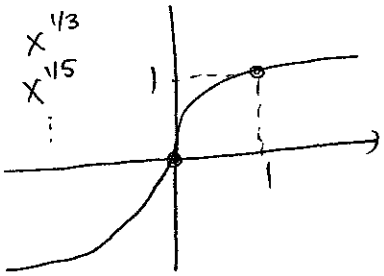


Case 2: $0 < a < 1$

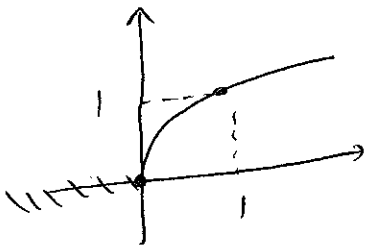
If $\frac{1}{a}$ is integer and even $(x^{1/2}, x^{1/4} \ldots)$



If $\frac{1}{a}$ is integer and odd

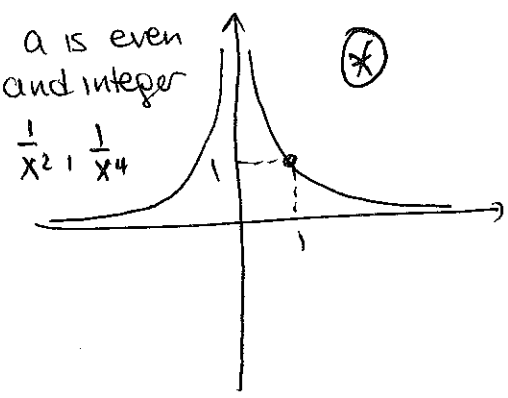


All other a

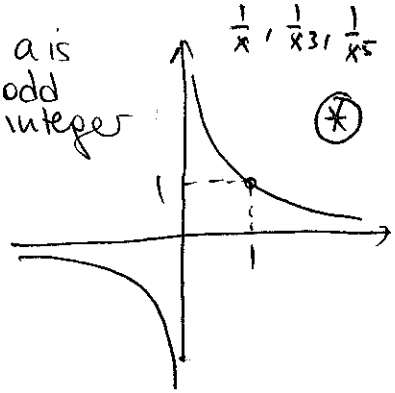


Case 3 $a < 0$

a is even and integer $\frac{1}{x^2}, \frac{1}{x^4}$



a is odd integer $\frac{1}{x}, \frac{1}{x^3}, \frac{1}{x^5}$



otherwise