Continuity and Asymptotes for common functions			
Function	**Continuous on**	**Vertical Asymptotes**	**Horizontal Asymptotes**
$f(x) = \frac{1}{x^n}$ for n a positive integer	$\mathbb{R} \setminus \{0\}$	$x = 0$	$y = 0$
$f(x) = \sqrt[n]{x}$	$\mathbb{R}$ if n is odd, $\mathbb{R}_{\geq 0}$ if n is even	None	None
$f(x) = a_n x^n + \ldots + a_1 x + a_0$	$\mathbb{R}$	None	None
$f(x) = \frac{P(x)}{Q(x)}$, where $P(x)$, $Q(x)$ are polynomials	All real numbers except those $x \in \mathbb{R}$ for which $Q(x) = 0$	It depends!	It depends!
$f(x) = a^x$ for $a > 0$ and $a \neq 1$	$\mathbb{R}$	None	$y = 0$
$f(x) = \ln(x)$	$\mathbb{R}_+ = (0, +\infty)$	$x = 0$	None
$f(x) = \sin(x)$	$\mathbb{R}$	None	None
$f(x) = \tan(x)$	All real numbers but $\frac{k\pi}{2}$, where k is an odd integer. (This is where $\cos(x) = 0$.)	$x = \frac{k\pi}{2}$, where k is an odd integer.	None
$f(x) = \arcsin(x)$	$[-1, 1]$	None	None
$f(x) = \arccos(x)$	$[-1, 1]$	None	None
$f(x) = \arctan(x)$	$\mathbb{R}$	None	$y = \frac{\pi}{2}$ and $y = -\frac{\pi}{2}$