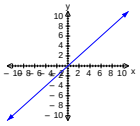
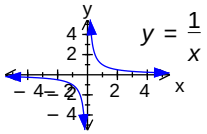
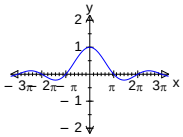
INTRODUCTION TO LIMITS

The functions listed in the following table have different types of behaviours on an interval containing $x = 0$. For each of the functions, complete the following table:

y=f(x)	*Domain f(x)*	*Range f(x)*	*Graph of y=f(x)*	*f*(0)	$\lim_{x\to 0^-} f(x)$	$\lim_{x\to 0^+} f(x)$	*Continuous at x = 0?*	*Does the limit at x = 0 exist?*
$f(x) = x$	$x \in R$	$y \in R$		0	0	0	*Yes, no holes, gaps, jumps, asymptotes.*	*Yes, the left hand limit equals the right hand limit.*
$f(x) = \frac{x^2}{x}$								
$f(x) = \frac{1}{x}$	$x \in R/\{0\}$	$y \in R/\{0\}$		*undefined*	$-\infty$	$+\infty$	*No, broken at x = 0.*	*No, left hand limit not equal to right hand limit.*
$f(x) = \frac{x}{x}$								
$f(x) = \lvert x \rvert$								

$f(x)=\frac{\sin x}{x}$	$x \in R/\{0\}$			*undefined*	1	1	*No, has a hole at (0, 1).*	
$f(x)=\frac{\lvert x\rvert}{x}$								
$f(x)=\sqrt{x}$								
$f(x)=\frac{1-\cos x}{x}$								
$f(x)=\frac{x^2-x}{x}$								