LIMITS

As $x \to a$ or $x \to \pm\infty$, if you get:	Then the limit is:	Comments	Example
$\frac{0}{c}, c \neq 0$	0		$\lim_{x\to\frac{\pi}{2}} \frac{1-\sin x}{\csc x}$
$\frac{c}{0}, c \neq 0$	$\pm\infty$	Plug in values or assess signs to determine the limit.	$\lim_{x\to 1} \frac{2-x}{(x-1)^2}$
$\frac{c}{\pm\infty}, c \neq 0$	0		$\lim_{x\to\infty} \frac{1}{e^{x^2}}$
$\frac{0}{\pm\infty}$	0		$\lim_{x\to 0^+} \frac{x}{\ln x}$
$\frac{\pm\infty}{0}$	$\pm\infty$		$\lim_{x\to 0^+} \frac{\ln x}{x}$
$\frac{0}{0}$ *or* $\frac{\pm\infty}{\pm\infty}$	Indeterminate	Use L'Hospital's Rule, factor, multiply by conjugate, or divide by highest power of x in denominator (if $x \to \pm\infty$)	$\lim_{x\to\frac{\pi}{2}^+} \frac{\cos x}{1-\sin x}$, $\lim_{x\to\infty} \frac{\ln x}{\sqrt{x}}$
$0 \cdot \pm\infty$	Indeterminate	Divide by reciprocal of one factor to convert to $\frac{0}{0}$ *or* $\frac{\pm\infty}{\pm\infty}$	$\lim_{x\to\infty} x\sin\left(\frac{\pi}{x}\right)$
$\infty - \infty$	Indeterminate	Get common denominator or multiply by conjugate to convert to $\frac{0}{0}$ *or* $\frac{\pm\infty}{\pm\infty}$	$\lim_{x\to 0}(\csc x - \cot x)$
$\infty + \infty$	∞		$\lim_{x\to-\infty} x^4 + x^6$
$\infty \cdot \infty$	∞		$\lim_{x\to\infty} x\ln x$
$0^0, \infty^0, 1^\infty$	Indeterminate	Take natural log of function to convert to $0 \cdot \pm\infty$, last step remove natural log using e	$\lim_{x\to\infty} x^{\frac{1}{x}}$