

## Calculus 1: HOW TO DETERMINE A LIMIT

Result by D.S.	Indicates	Limit Testing Procedure	Conclusion
<b>Real #</b>	Function is continuous at the indicated x-value	No further testing required	Limit value equals the function value
<b>0 / 0</b>	Hole at the indicated x- value	Cancel the common factor, substitute the x-value back into what remains	Limit will be the y-value of the hole
<b>Real # / 0</b>	Vertical Asymptote at the indicated x-value	Select a test value (.01) to the appropriate side of the VA and substitute back into the function to determine the infinite direction.	Limit will be approaching + / - infinity <b>OR</b> DNE if there is lack of agreement from both sides
<b>inf/inf</b>	x approaching +/- infinity	Divide all terms in the numerator and denominator by the degree of the bottom to re-write the function. Allow all terms with infinity in the bottom to become 0 and determine what the limit is from what remains.	Limit will be determined according to the HA rules! (See below)
			#1: Denominator degree is larger: Limit value = 0 (HA) #2: Num/Denom degree are the same: Limit value = ratio of coefficients (HA) #3: Numerator degree is larger:        Limit value = +/- infinity (HA = none)