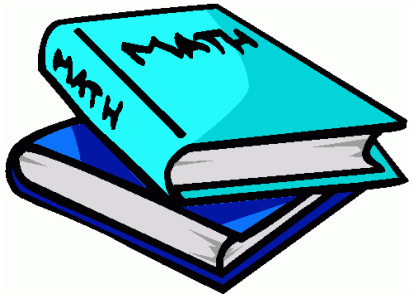
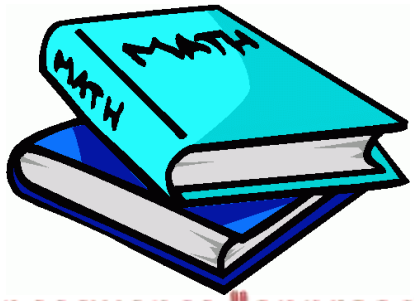


LIMIT



Definition: is used to describe the value that a function or sequence "approaches" as the input or index approaches some value

EXAMPLE↓↘

Shown as:

$$\lim_{x \to a} f(x)$$

This means that we are looking at values of $f(x)$ as x gets closer and closer to the value of a.

Sometimes you are able to substitute in $x = a$ to find the *term* and sometimes we have to factor and try to cancel some terms before evaluating.

$$\lim_{x \to 1} \frac{x^2 - 1}{x - 1}$$

Notice that we can't just evaluate this at $x = 1$

The funtion isn't defined at $x = 1$. However, by manipulating the equation, we can try to get some cancellation to occur:

$$\lim_{x \to 1} \frac{x^2 - 1}{x - 1}$$

$$= \lim_{x \to 1} \frac{(x - 1)(x + 1)}{(x - 1)}$$

$$= \lim_{x \to 1} (x + 1)$$

$$= 2$$

Since we are looking at the values closer and closer to $x=1$, we are allowed to cancel the x-1 term and are left with $x+1$ term. We can then proceed to evaluate this at $x = 1$.