Logs

Trigonometry

Different

Derivatives

Function inside integral - integrand

C - constant of integration

dx - variable of integration

, if lim towards inf, then =x, else =-x

factor out fastest growing

simplify

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Limits

Functions

Vertical mirroring: f(-x)

Horizontal mirroring: -f(x)

Numerator / Denominator

Quadratic function: y=ax^2+bx+c

Exponential function y=b^x , never (0,0)

Logarithmic (inverse of exponential)

Point discontinuing \_\_-\_\_ (has lim)

Jump discontinuing \_\_--- (no lim)

Asymmetric Discontinuing (or infinite sometimes)

Function solving steps:



Left continuous: lim-=f(x)

Right continuous: lim+=f(x)

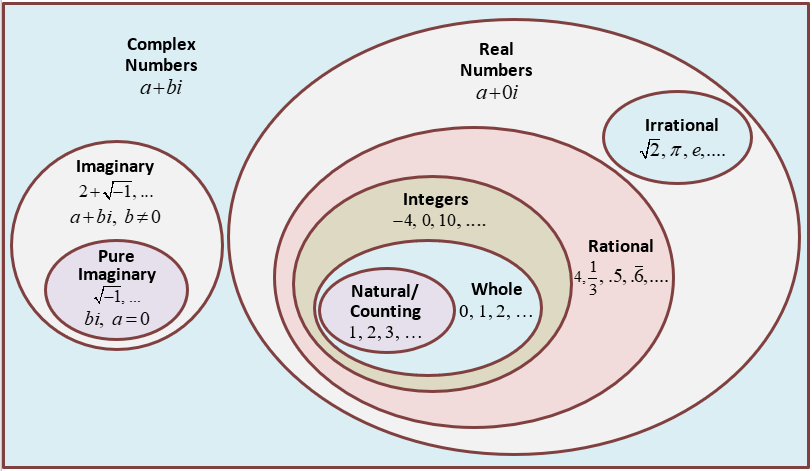
Elementary functions: all that I ever knew

Non-elementary functions: piecewise function

Polynomial: , where c is coefficient

A polynomial:

Not a polynomial:





Manipulation of continuous functions results in a continuous, unless f(x)/d(x) and d(x)=0

Even root function is continuous at positive x

Odd root numbers are continuous at real numbers

sin and cos are always continuous. tan (sin/cos) and sec (1/cos) continuous except (when cos=0)

is an inverse of

(odd powers, so sign changes at the breakpoints

If piecewise function has division but x=0 is out of range, then ok

Always check the roots in and

Parabola min/max:

- constant multiple

- sum/difference

- product

- quotient

- composition

Basic functions

- constants

- powers

- exponentials

- logarithms

- trigonometric

- inverse trigonometric

Trigonometry

Different

DNE - does not exist

Always factor out the smallest

Geogebra.org

Geometry

Sphere:

Cone:

Derivatives

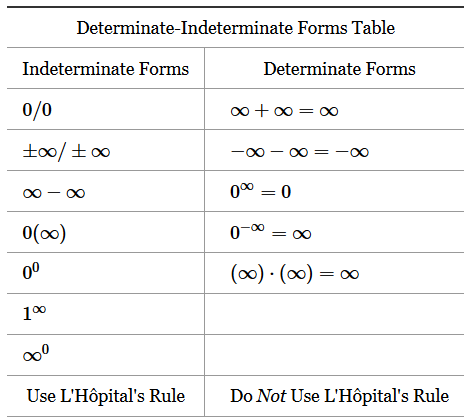
= velocity at f(x)

- derivative of a derivative

- derivative of a derivative of a derivative

- derivative of a derivative n times





To find VA, search for and

To find HA, search for and 

Explicit function: y=f(x)

Implicit function: …

, if lim towards inf, then =x, else =-x

|  |  |  |  |
| --- | --- | --- | --- |
| Quantity | Symbol | Calculus | Units |
| Distance | s(t) |  | distance |
| Velocity | v(t) | =s’(t) | distance/time |
| Acceleration | a(t) | =v’(t)=s’’(t) | distance/time2 |
| Jerk | j(t) | =a’(t)=v’’(t)=s’’’(t) | distance/time3 |

Finding HA: fill in > deterministic/irr > try left and right > simplify/fold

If on (a,b) then f is concave up on (a,b), and opposite

Decreasing/Increasing(if odd, sign change)



Concave up/down







If plug in x and y, then get y’ sign

If y is positive, then y’’ is positive (concave up)

* If f is continuous and differentiable at [a,b] and f(a)=f(b), then there exists a point c, where f’(c)=0
* If f(x) is continuous at [a,b], then there is an absolute minimum at f(c) and absolute maximum f(d), where c and d are in [a,b]
* If f(c) is a local maximum or local minimum, then f’(c)=0

- real change

dx and dy - approximate change

Absolute points finder:

Finder critical of f’

Add boundaries of local

Find max and min among x value