

Exponential and log

Wednesday, December 27, 2017 12:21 PM

Exponential function

$$f(x) = A \cdot k^x$$

Of all the possible values of k , there is one that is special. That is the "e" and that is just a constant much like the constant $\pi=3.1416\dots$. Here $e = 2.7182\dots$

Exercise: Plot $f(x) = e^x$, $g(x) = 3^{2x+1}$

Common questions involve rules of exponent.

Natural Logarithm

$$f(x) = \ln(x)$$

Now these two go hand in hand as one is the inverse of the other. Hence if $y = e^x$ then $x = \ln(y)$ and if $y = \ln(x)$ then $x = e^y$.

Solve for x :

$$3^{2x+1} = 10.$$

$$5^{2x+1} = 7^{x+2}$$

Common Logarithm.

Normally when we have $a = b^c$ then that means that $\log_b a = c$. b is the base. When the problem says only log, it means the base is 10. hence $\log 100 = 2$ because $10^2 = 100$.

Solve for x :

$$3^{2x+1} = 10.$$

$$5^{2x+1} = 7^{x+2}$$

$$\log_2 X = 3$$

$$\log_2 16 = x$$

$$\log_{2x} 10 = 3$$

Plot:

$$f(x) = \ln(x)$$

$$g(x) = \log_2 x$$

Properties of Logs worth remembering (Try to prove these, it should be easy):

$$A = B \cdot C \rightarrow \log A = \log B + \log C$$

$$A^B = C \rightarrow \log C = B \cdot \log A$$

Solve for x :

$$(\log X)^2 = \log X^2$$

$$10^{3x-1} + 4 = 32$$

$$e^{3-2x} = 4$$

$$\log(x+2) + \log(x-1) = 1$$

$$\log_3(x+2) = \log_3(X^2)$$

$$\ln(X+5) = \ln \cdot X - 1 - \ln(x+1)$$

1st quarter review

Find the equation of a line perpendicular to $y=2x-3$ and passing through $(3,3)$.

Find the transformed equation when $y = 2x^2 - 1$ is moved 3 units up, 2 units to the right and reflected about the x -axis.

particular, different types of functions, analysis of graphs, and properties of functions using ICT tools and manipulative devices, and viewing functions as a way to model real-life data. The course ends with a discussion of sequences, series, Pascal's triangle, and their applications.

1st Quarter:

- Basic Plane and Coordinate Geometry
- Transformational Geometry
- Right Triangle Trigonometry

2nd Quarter:

- Analysis of Graphs: Polynomial and Rational Functions
- Other Types of Functions
- Inverse Functions

3rd Quarter:

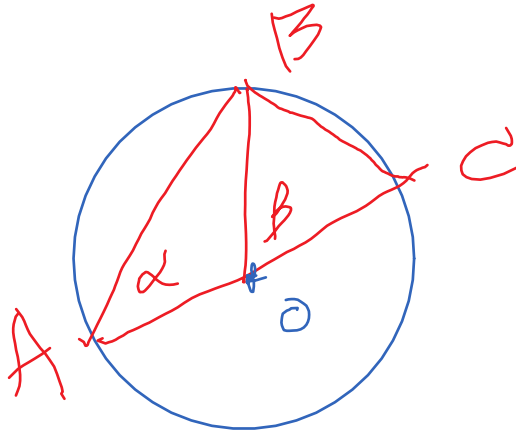
- Exponential and Logarithmic Functions

4th Quarter:

- Functions as Mathematical Models

Find the transformed equation when $y = x^2$ is stretched vertically twice, moved 3 units up, 2 units to the right and reflected about the x-axis.

Find the equation of a circle passing through three points (0,0), (2,3) and (1, -4).



A, B, and C are points in circle with center at O and whose radius is 4. Find the angles alpha and beta and the area of the triangles ABC and ABO if the length of BC is 4.

2nd quarter review

Find the domain and range of $y = 3/(x+2)$. Plot $f(x)$.

Find the domain and range of $y = 3(x-2)/(x^2-4)$. Plot $f(x)$.