Math 111
Exponential functions

(DEFINITION) A function f is **exponential** if it can be written as:

(EXAMPLE)

$f(x) = 2^x$

(NOTES) about $f(x) = a^x$

(DEFINITION) The **natural exponential function** has base:

Logarithmic functions

(DEFINITION) The **logarithmic function** of base a is the *inverse* of the exponential function with base a.

(EXAMPLES)

1. $f(x) = \log_2 x$

2. $f(x) = \ln x$ (**natural logarithmic function**)

3. g(x) = $\ln(2x - 1)$

(APPLICATIONS)

Suppose that $S(t) = 100e^{0.1t}$ represents the population of a growing colony of bacteria, with t measured in hours.

1. At what time is S twice its starting value?
2. At what time is S four times its starting value?

Trigonometric functions

(DEFINITIONS)

Two basic **trigonometric functions**, $\sin x$ and $\cos x$, are defined by:

(NOTES)

(OTHER EXAMPLES)