Autodesk Inventor Tutorials

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Introduction to Inventor Functions

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Inventor provides several functions for use in dimensions, parameters and equations. While some of these functions' uses are obvious, some are not. In this lesson I will review the functions and their uses and provide some example of their use.

First let's review the available functions. (This table is available in the IV help file)

Function	Return Unit	Expected Units	Description
cos(expr)	unitless	angle	returns cosine of an angle
sin(expr)	unitless	angle	returns sine of an angle
tan(expr)	unitless	angle	returns tangent of an angle
acos(expr)	angle	unitless	returns arccosine angle of a value
asin(expr)	angle	unitless	returns arcsine angle of a value
atan(expr)	angle	unitless	returns arctangent angle of a value
cosh(expr)	unitless	angle	returns the hyperbolic cosine of an angle
sinh(expr)	unitless	angle	returns the hyperbolic sine of an angle
tanh(expr)	unitless	angle	returns the hyperbolic tangent of an angle
acosh(expr)	angle	unitless	returns hyperbolic arccosine angle of a value
asinh(expr)	angle	unitless	returns hyperbolic arcsine angle of a value
atanh(expr)	angle	unitless	returns hyperbolic arctangent angle of a value
sqrt(expr)	unit^1/2	any	returns the square root of a value
sign(expr)	unitless	any	returns 0 if value is negative, 1 if positive
exp(expr)	unitless	any	returns the exponential power of the expression
floor(expr)	any	any	rounds number down, toward zero, to the nearest integer
ceil(expr)	any	any	rounds number up, away from zero, to the nearest integer
round(expr)	any	any	rounds number to nearest integer
abs(expr)	any	any	returns absolute value of expression
max(expr1;expr2)	any	any	returns the maximum value of expression1 or expression2
min(expr1;expr2)	any	any	returns the minimum value of expression1 or expression2
ln(expr)	unitless	unitless	returns the natural log of the expression
log(expr)	unitless	unitless	returns the log of the expression
pow(expr1;expr2)	unit^expr2	any/unitless	raises expr1 to the power of expr2 *
random()	unitless	unitless	creates a random number
isolate(expr;unit;unit)	unitless	unitless	changes the units of a parameter

**** Please note that the IV help file has an error. The function pow(expr1;expr2) is incorrectly listed as pow(expr1,expr2)*** **(semicolon instead of comma)**

Some of examples of the not so obvious functions are below:

SIGN
sign(40) = 1
sign(-40)= 0

FLOOR
floor(4.99999)=4.0
floor(5.00001)=5.0
floor(-4.99999)=-5.0

CEIL
ceil(4.99999)=5.0
ceil(5.00001)=6.0
ceil(-4.99999)=-4.0

ROUND
round(4.49)=4.0
round(4.5)=5.0
round(4.501)=5.0

ABS
abs(-5)=5
abs(3.33)=3.33

MAX
assume we have two expressions: d1=10, d2=20
max(d1;d2)=20
max(d1;(d2-15))=10 (since d2-15=5)

MIN
assume we have two expressions: d1=10, d2=20
min(d1;d2)=10
min(d1;(d2-15))=5 (since d2-15=5)

POW
assume we have two expressions d1=5*in d2=2*ul
pow(d1;d2) = 25*in*in

ISOLATE
assume we have a parameter d1=20 deg that we want to change to inches
isolate(d1;deg;in) = 20*in

With all functions you must be careful to keep units consistent

In the next lesson we will take some of these concepts and apply them to moving multiple parts by driving one single constraint and having other constraints refer to them.