## IceMan - Math

Most of these functions correspond to the C math library equivalents, and are called on a per-pixel basis. Given the limited precision of Fractional and Fixed Point types, some operations must be used with care. (Values are automatically clamped to the legal range).

## ice.Image Abs()

Absolute value.

## ice.Image Add(b)

Add two images.

## Parameters

b
second operand (ice.Image).

## ice.Image AddWrap(b)

# Add two images, but wrap the result so that it falls in the range 0-1. Something like a floating point modulo operation. 

## Parameters

b
second operand (ice.Image)

## ice.Image ACos() <br> Inverse cosine.

## ice.Image ASin() <br> Inverse sine.

## ice.Image ATan()

Inverse tangent.
ice.Image ATan2(x)
Inverse tangent operation. The image being operated upon is the perpendicular, or y .

## Parameters

x
Base (ice.Image).

## ice.Image Ceil()

Round up to nearest integer.

## ice.Image $\operatorname{Cos}()$

Cosine.

## ice.Image Cosh()

Hyperbolic cosine.

## ice.Image Divide(b)

Divide one image by another: the image being operated upon is the numerator.

## Parameters

b
Denominator (ice.Image).

## ice.Image $\operatorname{Exp}()$

Inverse natural logarithm.

## ice.Image Floor()

Round down to nearest integer.

## ice.Image $\operatorname{Hypot}(b)$

Compute the hypotenuse of a triangle: the image being operated upon is the first operand.

## Parameters

## b

Second side of the "triangle" (ice.Image).

## ice.Image $\operatorname{Ln}()$

Natural logarithm.

## ice.Image $\operatorname{Max}(b)$

Result is the maximum of the two inputs.

## Parameters

b
Second operand (ice.Image).

## ice.Image $\operatorname{Min}(b)$

Result is the minimum of the two inputs.

## Parameters

Second operand (ice.Image).

## ice.Image Multiply(b)

Multiply two images. The multiplier is the image being operated upon.

## Parameters

$b$
Multiplicand (ice.Image).

## ice.Image MultiplyAccumulate( $b, c$ )

Multiply image a by b and add c .

## Parameters

## b

Scale (ice.Image).

## c

Offset (ice.Image).

## ice.Image MultiplyComplement(b)

Implements a * (1 b). a is the image being operated upon.

## Parameters

## b

Second operand (ice.Image).

## ice.Image Pow(b)

Raise this image to the b power.

## Parameters

b
Second operand (ice.Image).

## ice.Image Round()

Round to nearest integer.

## ice.Image Sign()

Signum function.
Return value is 1 for positive values, and 1 for negative ones.

## ice.Image Sine()

Sine function.

## ice.Image Sinh()

Hyperbolic sine.

## ice.Image SmoothStep(min, max)

Return 0 if less than the lower threshold, 1 if greater than the upper threshold, and smoothly varying in between. (A cubic is used, with $c 1$ continuity at both ends).

## Parameters

min
Lower threshold (ice.Image).
max
Upper threshold (ice.Image).

## ice.Image Subtract(b)

Subtract two images. The minuend is the image being operated upon.

## Parameters

b
Subtrahend (ice.Image).

## ice.Image Tan()

Tangent function.

## ice.Image Tanh()

Hyperbolic tangent.

