

## 10.1.13 Editors - Geometry Nodes Editor - Header - Add Menu - Utilities

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### Detailed table of content

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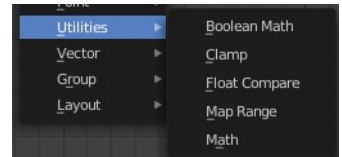
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## Add menu - Point

Utility nodes are mainly for mathematical operations.



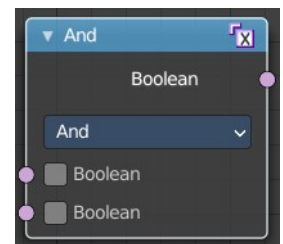
## Boolean Math

The Boolean Math node performs a basic logical operation between its inputs.

### Inputs

#### *Boolean*

Two standard Boolean inputs.

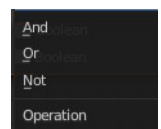


### Properties

#### *Operation*

#### **And**

True if both inputs are true.



## Or

True if either or both inputs are true.

## Not

True if both inputs are false.

## Output

Boolean

Standard Boolean output.

---

## Clamp Node

Clamps a value between a minimum and a maximum.

### Inputs

#### *Value*

The input value to be clamped.

#### *Min*

The minimum value.

#### *Max*

The maximum value.

### Properties

#### *Clamp Type*

#### **Min Max**

Clamp values using Min and Max values.

#### **Range**

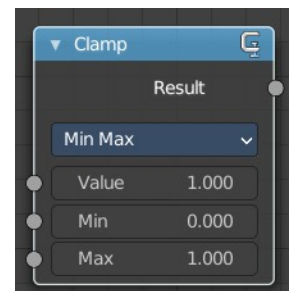
Clamp values between Min and Max range.

### Outputs

#### *Result*

The input value after clamping.

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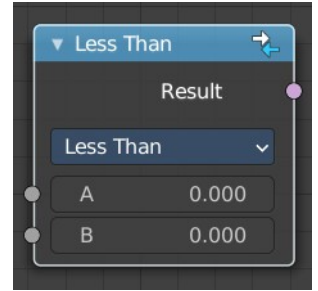
## Float Compare

The Float Compare node takes two inputs and does a math comparison between them.

### Inputs

#### A, B

Standard float value input.



### Properties

#### Operation

##### A is less than B

True if A is smaller than B.

##### A is lesser than or equal B

True if A is smaller or equal than B.

##### A is greater than B

True if A is bigger than B.

##### A is greater than or equal B

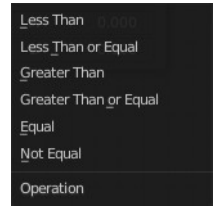
True if A is bigger or equal than B.

##### A is equal B

True if A and B are the same.

##### A is not equal B

True if A and B are different.



### Output

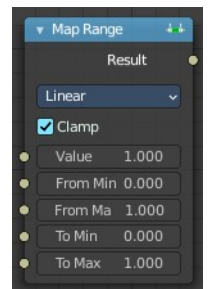
#### Result

Standard Boolean output.

---

## Map Range

This node converts (maps) an input value range into a destination range. By default, values outside the specified input range will be proportionally mapped as well. This node is similar to Map Value node but provides a more intuitive way to specify the desired output range.



## Inputs

### **Value**

Standard value input.

### **From Min**

Start of the input value range.

### **From Max**

End of the input value range.

### **To Min**

Start of the destination range.

### **To Max**

End of the destination range.

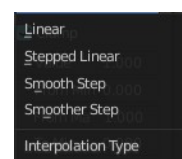
## Properties

### **Interpolation Type**

how to interpolate the values between min and max.

### **Clamp**

Clamps values to Min/Max of the destination range.



## Outputs

### **Value**

Standard value output.

## Math Node

The Math Node performs math operations.

### Inputs

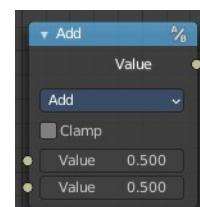
The inputs of the node are dynamic. Some inputs are only available with certain operations. For example, the Addend input is only available in the Multiply Add operator.

### **Value**

Input Value. Trigonometric functions read this value as radians.

### **Addend**

Input Addend.



## **Base**

Input Base.

## **Exponent**

Input Exponent.

## **Epsilon**

Input Epsilon.

## **Distance**

Input Distance.

## **Min**

Input Minimum.

## **Max**

Input Maximum.

## **Increment**

Input Increment.

## **Scale**

Input Scale.

## **Degrees**

Input Degrees.

## **Radians**

Input Radians.

## **Properties**

### **Operation**

The mathematical operator to be applied to the input values:

### **Functions**

#### **Add**

The sum of the two values.

#### **Subtract**

The difference between the two values.

Functions	Comparison	Rounding	Trigonometric	Conversion
Add	Minimum	Round	Sine	To Radians
Subtract	Maximum	Floor	Cosine	To Degrees
Multiply	Less Than	Ceil	Tangent	
Divide	Greater Than	Truncate	Arcsine	
Multiply Add	Sign	Fraction	Arccosine	
Power	Compare	Modulo	Arctangent	
Logarithm	Smooth Minimum	Wrap	Arctan2	
Square Root	Smooth Maximum	Snap	Hyperbolic Sine	
Inverse Square Root		Ping-pong	Hyperbolic Cosine	
Absolute			Hyperbolic Tangent	
Exponent				

### ***Multiply***

The product of the two values.

### ***Divide***

The division of the first value by the second value.

### ***Multiply Add***

The sum of the product of the two values with Addend.

### **Power**

The Base raised to the power of Exponent.

### ***Logarithm***

The log of the value with a Base as its base.

### ***Square Root***

The square root of the value.

### ***Inverse Square Root***

One divided by the square root of the value.

### ***Absolute***

The input value is read with without regard to its sign. This turns negative values into positive values.

### ***Exponent***

Raises Euler's number to the power of the value.

### **Comparison**

#### ***Minimum***

Outputs the smallest of the input values.

#### ***Maximum***

Outputs the largest of two input values.

#### ***Less Than***

Outputs 1.0 if the first value is smaller than the second value. Otherwise the output is 0.0.

#### ***Greater Than***

Outputs 1.0 if the first value is larger than the second value. Otherwise the output is 0.0.

#### ***Sign***

Extracts the sign of the input value. All positive numbers will output 1.0. All negative numbers will output -1.0. And 0.0 will output 0.0.

#### ***Compare***

Outputs 1.0 if the difference between the two input values is less than or equal to Epsilon.

#### ***Smooth Minimum***

Smooth Minimum.



### ***Smooth Maximum***

Smooth Maximum.

### **Rounding**

#### ***Round***

Round the input value to the nearest integer.

#### ***Floor***

Rounds the input value down to the nearest integer.

#### ***Ceil***

Rounds the input value up to the nearest integer.

#### ***Truncate***

Outputs the integer part of the value.

#### ***Fraction***

Fraction.

#### ***Modulo***

Outputs the remainder once the first value is divided by the second value.

#### ***Wrap***

Outputs a value between Min and Max based on the absolute difference between the input value and the nearest integer multiple of Max less than the value.

#### ***Snap***

Round the input value to down to the nearest integer multiple of Increment.

#### ***Ping-pong***

The output value is moved between 0.0 and the Scale based on the input value.

### **Trigonometric**

#### ***Sine***

The Sine of the input value.

#### ***Cosine***

The Cosine of the input value.

#### ***Tangent***

The Tangent of the input value.

#### ***Arcsine***

The Arcsine of the input value.

#### ***Arccosine***

The Arccosine of the input value.

### ***Arctangent***

The Arctangent of the input value.

### ***Arctan2***

Outputs the Inverse Tangent of the first value divided by the second value measured in radians.

### ***Hyperbolic Sine***

The Hyperbolic Sine of the input value.

### ***Hyperbolic Cosine***

The Hyperbolic Cosine of the input value.

### ***Hyperbolic Tangent***

The Hyperbolic Tangent of the input value.

## **Conversion**

### ***To Radians***

Converts the input from degrees to radians.

### ***To Degrees***

Converts the input from radians to degrees.

### ***Clamp***

Limits the output to the range (0.0 to 1.0). See Clamp.

## **Outputs**

### ***Value***

Numerical value output.