

# RightQuasigroups

## Computing with one-sided quasigroups in GAP.

### 0.1

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# Chapter 1

## Introduction

RightQuasigroups is a package which does some interesting and cool things

## Chapter 2

# Functionality

### 2.1 Construction Filters

This section will describe the construction filters of right quasigroups.

#### 2.1.1 IsRightQuasigroupElement (for IsMultiplicativeElement)

- ▷ `IsRightQuasigroupElement(object)` (filter)  
**Returns:** true or false  
A GAP category of elements of right quasigroups.

### 2.2 Construction Methods

This section will describe the construction methods of right quasigroups.

#### 2.2.1 IsRightQuasigroupMagma (for IsObject)

- ▷ `IsRightQuasigroupMagma(object)` (filter)  
**Returns:** true or false  
An auxiliary category for GAP to tell apart `IsMagma` and `IsRightQuasigroup`.

#### 2.2.2 IsRightQuasigroup (for IsMagma and IsRightQuasigroupMagma)

- ▷ `IsRightQuasigroup(object)` (filter)  
**Returns:** true or false  
A GAP category of right quasigroups.

#### 2.2.3 ProjectionRightQuasigroup (for IsCollection)

- ▷ `ProjectionRightQuasigroup(set)` (operation)  
**Returns:** The projection right quasigroup on the set *set*  
The operation is defined by  $x * y = x$ .

### 2.2.4 RightQuasigroupByFunctions (for IsCollection, IsFunction, IsFunction)

▷ `RightQuasigroupByFunctions(set, f, g)` (operation)

**Returns:** The right quasigroup  $(Q, *, /)$ , where  $Q$  is indexed by *set* and  $x * y = f(x, y)$  and  $x / y = g(x, y)$ .

The identities  $f(g(x, y), y) = x$  and  $g(f(x, y), y) = x$  must hold.

### 2.2.5 RightQuasigroupByFunction (for IsCollection, IsFunction)

▷ `RightQuasigroupByFunction(set, f, g)` (operation)

**Returns:** The right quasigroup  $(Q, *, /)$ , where  $Q$  is indexed by *set* and  $x * y = f(x, y)$  and  $x / y = z$  iff  $z = f(x, y)$ .

For any  $x, z$  there must be a unique  $y$  such that  $f(x, y) = z$ .

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