

## Group 1

**J symbol (dollar):** \$

### Monadic case:

Name: *shape*

Rank: `_` (infinite/unbounded) – applies to the entire array `y`

Definition (simple): `$ y` is the shape of `y` (i.e., a list of the lengths of each axis of `y`).

Definition (precise): `$ y` returns a numeric list, where the  $i$ th element of the list is the length of the  $i$ th axis of `y`, or if `y` is a scalar then `$ y` is an empty list (scalars have no axes).

Please also include *explanations* for your answers to some of the following questions:

What is the shape of a scalar, vector, matrix, rank 3 array?

What is the shape of an empty list?

How do you find the rank of a scalar, vector, matrix, r-array using `$` ?

### Dyadic case:

Name: *reshape*

Rank: 1 (left); `_` (right) – applies to a vector on the left and the entire array on the right

Definition (simple): `x $ y` reshapes array `y` into the shape specified by `x`.

Definition (precise): `x $ y` the shape of `x $ y` is `x`, `siy` where `siy` is the shape of an item of `y`; `x $ y` gives a length error if `y` is empty and `x`, `siy` does not contain a zero.

Please also include *explanations* for your answers to some of the following questions:

Reshape a scalar, vector, matrix?

What happens when (an element of) `x` is 0?

What happens when `x` is empty?

What happens when `y` contains too many elements?

What happens when `y` contains too few elements?