GetIndexOfPauliString

```
SetDirectory @ NotebookDirectory[];
Import["../Link/QuESTlink.m"];
```

Doc

```
? GetIndexOfPauliString
```

Symbol
GetIndexOfPauliString[product] returns the integer index of the given Pauli product in the ordered basis of Pauli products. The zero target is treated as least significant.
GetIndexOfPauliString[string] returns a list of {index, coefficient} pairs which describe all Pauli products in the given string.
To force GetIndexOfPauliString[product] to return the same format as GetIndexOfPauliString[string], simply call GetIndexOfPauliString[1. product].
⌄

Correctness

Product

```
GetIndexOfPauliString[Id_4]
```
0

```
GetIndexOfPauliString[X_0]
GetIndexOfPauliString[Y_0]
GetIndexOfPauliString[Z_0]
```
1

2

3

```
GetIndexOfPauliString[X_1]
GetIndexOfPauliString[X_1 Id_0]
```
4

4

```
GetIndexOfPauliString[Z_34] === 3 × 4^34
```
True

```
GetIndexOfPauliString[ Product[Z_t, {t, 0, 34}] ] === 4^{34+1} - 1
```
True

```
ind = 1 245 194;
ind === GetIndexOfPauliString @ GetPauliStringFromIndex[ind]
```
True

String

```
GetIndexOfPauliString[X_0 + a Y_0 + Z_3 X_0 + a X_0 b Y_2 c Z_4]
```
{{1, 1}, {2, a}, {193, 1}, {801, a b c}}

```
GetIndexOfPauliString[X_0 + a z X_0]
```
{{1, 1}, {1, a z}}

```
GetIndexOfPauliString[ Z_3 X_0 ]
GetIndexOfPauliString[ X_0 Y_2 Z_4]
GetIndexOfPauliString[X_0 + a Y_0 + Z_3 X_0 + a X_0 b Y_2 c Z_4]
```
193

801

{{1, 1}, {2, a}, {193, 1}, {801, a b c}}

```
GetIndexOfPauliString[ X_0 ]
GetIndexOfPauliString[ 1. X_0 ]
```
1

{{1, 1.}}

Errors

```
GetIndexOfPauliString[X_{-1}]
```
⊙ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

```
GetIndexOfPauliString[X_{-1} Y_0]
```
⊙ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

```
GetIndexOfPauliString[X_{-1} Y_0 + X_2]
```
⊙ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

GetIndexOfPauliString[X$_0$ X$_0$]

⋯ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

GetIndexOfPauliString[X$_0$ Y$_0$]

⋯ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

GetIndexOfPauliString[1]

⋯ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

GetIndexOfPauliString[1]
GetIndexOfPauliString[a, b]

⋯ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed

⋯ GetIndexOfPauliString: Invalid arguments. See ?GetIndexOfPauliString

$Failed