

NAG Toolbox for MATLAB

x02an

1 Purpose

x02an returns the **safe range** of complex floating-point arithmetic.

2 Syntax

```
[result] = x02an()
```

3 Description

x02an is defined to be the smallest positive model number z such that for any x in the range $[z, 1/z]$ the following can be computed without undue loss of accuracy, overflow, underflow or other error:

$-w$
 $1/w$
 $-1/w$
 $\text{SQRT}(w)$
 $\text{LOG}(w)$
 $\text{EXP}(\text{LOG}(w))$
 $y * (\text{LOG}(w)/\text{LOG}(y))$ for any y
 $\text{ABS}(w)$

where w is any of x , ix , $x + ix$, $1/x$, i/x , $1/x + i/x$, and i is the square root of -1 .

4 References

None.

5 Parameters

5.1 Compulsory Input Parameters

None.

5.2 Optional Input Parameters

None.

5.3 Input Parameters Omitted from the MATLAB Interface

None.

5.4 Output Parameters

1: **result** – double scalar

The result of the function.

6 Error Indicators and Warnings

None.

7 Accuracy

None.

8 Further Comments

None.

9 Example

```
[result] = x02an()
```

```
result =  
    2.2251e-308
```
