

## CoCoALib - Bug #1605

### binomial: domain of defn?

02 Aug 2021 10:27 - John Abbott

<b>Status:</b>	Closed	<b>Start date:</b>	02 Aug 2021
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>	John Abbott	<b>% Done:</b>	100%
<b>Category:</b>	Tidying	<b>Estimated time:</b>	1.51 hour
<b>Target version:</b>	CoCoALib-0.99800	<b>Spent time:</b>	1.45 hour
<b>Description</b>			
What should the domain of definition of <b>binomial(n,r)</b> be?			
Most restrictive is $0 \leq r \leq n$ .			
More flexible is $0 \leq r \leq \text{abs}(n)$ .			
Or we could allow allow all pairs.			
The current implementations are inconsistent (depending on whether args are MachineInt or BigInt).			

### History

#### #1 - 02 Aug 2021 11:57 - John Abbott

The sample implementations on the Wikipedia page accept all pairs of integers as args, with the convention that the value is 0 if the second arg is negative.

Wolfram proposes the following convention <https://mathworld.wolfram.com/BinomialCoefficient.html> (namely the value is 0 whenever  $r < 0$  or  $r > \text{abs}(n)$ )

#### #2 - 02 Aug 2021 11:59 - John Abbott

- Status changed from New to In Progress

- % Done changed from 0 to 10

So the main question is: is it better to allow the fully general definition, or better to "protect the careless user"?

Right now I am favouring allowing the fully general definition.

#### #3 - 02 Aug 2021 14:03 - John Abbott

- Subject changed from binomial: range of defn? to binomial: domain of defn?

- Description updated

#### #4 - 02 Aug 2021 16:13 - John Abbott

- Status changed from In Progress to Resolved

- Assignee set to John Abbott

- % Done changed from 10 to 50

I have changed the code to use the fully general defn... not really sure why it was not already so defined.

Changed test-BigInt2.C as well.

Will check in a bit later.

**#5 - 03 Aug 2021 10:01 - Anna Maria Bigatti**

John Abbott wrote:

I have changed the code to use the fully general defn... not really sure why it was not already so defined.  
Changed test-BigInt2.C as well.  
Will check in a bit later.

Sounds ok to me.

**#6 - 03 Aug 2021 14:19 - John Abbott**

- *Status changed from Resolved to Feedback*
- *% Done changed from 50 to 90*

Mostly done now.

**#7 - 14 Sep 2021 12:01 - John Abbott**

- *Status changed from Feedback to Closed*
- *% Done changed from 90 to 100*
- *Estimated time set to 1.51 h*