

IMA2017_the_symbolic_mess

August 24, 2017

1 The symbolic mess

The symbolic ring (SR) is not fitted to answer mathematical questions like equality, existence, etc.

Every elements in the symbolic ring are expression with no defined semantics... as a consequence we end up with many errors.

1.1 1 - functions are not well defined objects

```
In [1]: exp.category()
```

```
Out[1]: Category of objects
```

```
In [9]: zeta(5).is_real()
```

```
Out[9]: False
```

```
In [10]: cos(pi/7).is_real()
```

```
Out[10]: True
```

```
In [13]: x, y = SR.var('x,y')
         assume(x, 'real')
         assume(y, 'real')
         assume(x > 0)
         assume(y > 0)
```

```
In [14]: x^log(y) == y^log(x)
```

```
Out[14]: x^log(y) == y^log(x)
```

```
In [15]: bool(x^log(y) == y^log(x))
```

```
Out[15]: False
```

```
In [ ]:
```

1.2 2 - silently and unpredictably mixes exact and unexact numbers

```
In [3]: a = pi - 3.641592653589793238 + 1/2
        print a
```

```
pi - 3.14159265358979324
```

```
In [4]: a
```

```
Out[4]: pi - 3.14159265358979324
```

```
In [5]: bool(a == 0)
```

```
Out[5]: True
```

```
In [ ]:
```

1.3 3 - π and e are rationals

```
In [6]: 6701487259 * pi == 21053343141
```

```
Out[6]: 6701487259*pi == 21053343141
```

```
In [7]: bool(6701487259 * pi == 21053343141)
```

```
Out[7]: True
```

```
In [ ]:
```

```
In [8]: 161260336 * e == 438351041
```

```
Out[8]: 161260336*e == 438351041
```

```
In [9]: bool(161260336 * e == 438351041)
```

```
Out[9]: True
```

```
In [ ]:
```