OOP Project 1

Command line calculator in Java

What can it do ?

- Evaluate standard math operators

```
Enter expression to evaluate:
> 5+6^2 - 3/6
 = 40.5
```

- Evaluate common math functions and constants

```
Enter expression to evaluate:
> sin( ln (e^2))
 = 0.9092974268256817
```

What can it do ?

- remember the last result

```
Enter expression to evaluate:
> exp ( 3 )
 = 20.085536923187668

Enter expression to evaluate:
> ans * 2
 = 40.171073846375336
```

What can it do ?

- Display helper a helper menu and history

```
Enter expression to evaluate:
> !help
Supported Operators:
    +, -, *, / , ^
Supported Single Argument Functions:
    sin, cos, ln, exp,
Function use syntax:
    function('argument')
    or  function 'argument'
    eg: sin(ln(13)) <=> sin ln 23
Supported Constants:
    e, pi
```

```
Enter expression to evaluate:
> !his
5+6^2 - 3/6
ans + sin(ln(67))
sin(ln(67))
sin( ln (e^2))
```

Problems I encountered

Imperative / functional style of thinking

- First writing the logic, then creating objects around it

What I learned

1. Not naming objects with "-er" actually makes sense
   a. "Parser" -> "Expression"
2. Exceptions are better than Null, NaN etc.
3. Plan before you begin writing
4. OOP projects are hard to change after the planning stage
   a. Adding new, unplanned functionality is difficult.

What could be improved

- SYExpression class could be immutable: two types of expressions
- Calculator menu could take an out stream as argument