Dustin Van Tate Testa

1. From ghci
    a. `sin(cos pi)` => -0.8414709848078965
    b. `cos -1` gives a typeerror because the `cos` function cannot be inferred as Num Unary - (negation) must be explicitly stated with parens ie `cos (-1)`
    c. `sin cos pi` gives a typeerror because sin expected a Floating but received a function
    In order to produce the same result as (a) without parens use `sin . cos $ pi`
    d. `(sqrt . head [sqrt]) 16.0` => 2.0, the double square root of 16
2. A
    a. `cos (sqrt 2.5) + sin pi * 2` removing the parens changes order of operations but assignment specified “minimum set needed”
    b. `(:) ('a' : "b" ++ "cd") [ ['c'] ++ "d"]`: I also removed parens from string literal
    c. `[ [[ 17 ] ] ] : [ [ ] ]`
3. `(/) ((*) ((+) a b) c) ((^) d e)`
4. `(x `g` (a `h` b)) `f` c(e `d` f)`
5. `f x = x == [x !! i | i <- [0..(length x - 1)]]`
6. `stutter n x = [x | i <- [1..n]]`
7.

```
take 0 g = []

take 1 g = [1,3,5] : [rot x | x <- []]  (because take (n+1) g = head g
: take n g, by defn take)
         = [1,3,5] : []  (because there aren't any x in [] to take the
rot of)
         = [[1,3,5]]

take 2 g = [1,3,5] : [rot x | x <- take 1 g]
         = [1,3,5] : [rot x | x <- [[1,3,5]]]
         = [1,3,5] : rot [1,3,5] : [rot x | x <- []]
         = [1,3,5] : (5:[1,3]) :  [rot x | x <- []]  (defn rot)
         = [1,3,5] : [5,1,3] : []
         = [[1,3,5], [5,1,3]]


take 3 g = [1,3, 5] : [rot x | x <- take 2 g]
     = [1,3,5] : [rot x | x <- [[1,3,5],[5,1,3]]]
     = [1,3,5] : rot [1,3,5] : [rot x | x <- [[5,1,3]]]
     = [1,3,5] : (5:[1,3]) : [rot x | x <-[[5,1,3]]]
     = [1,3,5] : [5,1,3] : rot [5,1,3] : [rot x | x <-[]]
     = [1,3,5] : [5,1,3] : (3:[5,1]) : [rot x | <-[]]
     = [1,3,5] : [5,1,3] : [3,5,1] : []
```

```
     = [[1,3,5],[5,1,3],[3,5,1]]
```

As we can see here, this pattern repeats as there are only 3 possible rotation states a list of 3 elements that the expression can cycle through

```
take 4 g = [1,3,5] : [rot x | x <- take 3 g]
     = [1,3,5] : [rot x | x <- [[1,3,5],[5,1,3],[3,5,1]]]
     = [1,3,5] : rot [1,3,5] : [rot x | x <- [[5,1,3],[3,5,1]]]
     = [1,3,5] : (5 : [1, 3]) : [rot x | x <- [[5,1,3],[3,5,1]]]
     = [1,3,5] : [5,1,3] : rot [5,1,3] : [rot x | x <- [[3,5,1]]]
     = [1,3,5] : [5,1,3] : (3 : [5,1]) : [rot x | x <- [[3,5,1]]]
     = [1,3,5] : [5,1,3] : [3,5,1] : rot [3,5,1] : [rot x | x <- []]
     = [1,3,5] : [5,1,3] : [3,5,1] : (1 : [3,5]) : [rot x | x <- []]
     = [1,3,5] : [5,1,3] : [3,5,1] : [1,3,5] : []
     = [[1,3,5],[5,1,3],[3,5,1],[1,3,5]]
```