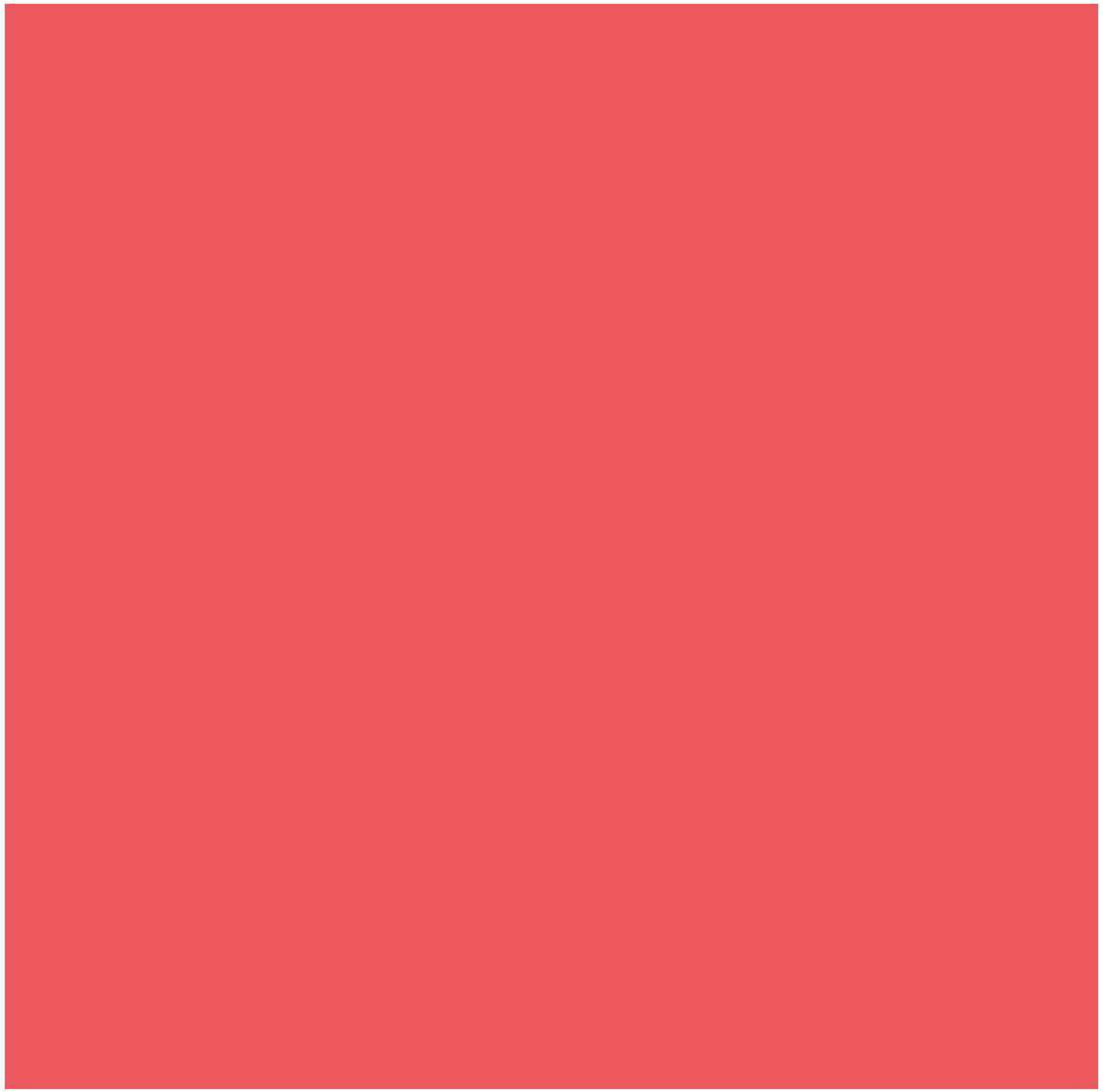
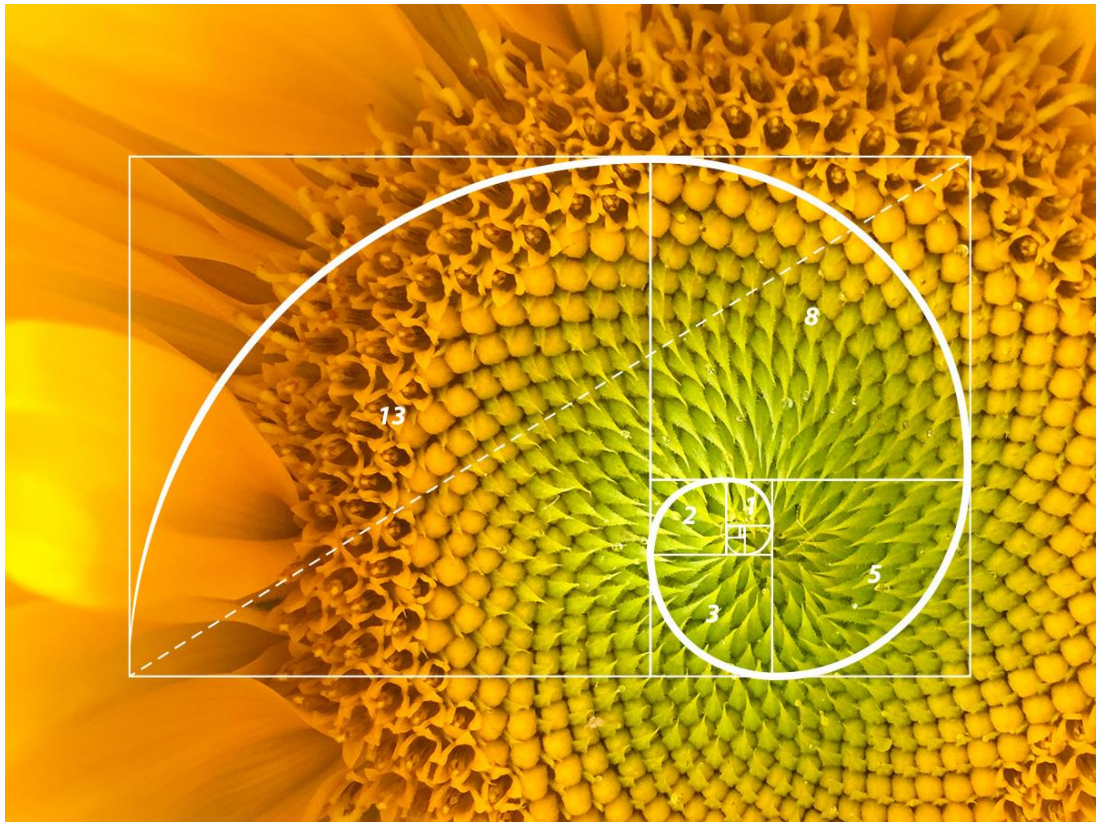
Recursive Tracing

slides adapted from Kasey Champion




13
8
2
1
5
3

Iterative Factorial

```
public static int iterativeFactorial(int n) {
    int result = 1;
    for (int i = 2; i <= n; i++) {
        result *= i;
    }
    return result;
}
```

result = (6 * 4) = 24

i = 4

Recursive Factorial

```
public static int recursiveFactorial(int 4 {
    public static int recursiveFactorial(int 3 {
        public static int recursiveFactorial(int 2 {
            public static int recursiveFactorial(int 1 {
                if (n == 1) {
                    return 1;
                } else {
                    return n * recursiveFactorial(n - 1);
                }
            }
        }
    }
}
```

Recursive Factorial

```
public static int recursiveFactorial(int 4 {
    public static int recursiveFactorial(int 3 {
        public static int recursiveFactorial(int 2 {
            public static int recursiveFactorial(int 1 {
                if (n == 1) {
                    return 1;
                } else {
                    return n * recursiveFactorial(n - 1);
                }
            }
        }
    }
}
```

Base Case!

Recursive Factorial

```
public static int recursiveFactorial(int n) {
    if (n == 1) {
        return 1;
    } else {
        return n * recursiveFactorial(n - 1);
    }
}
```

4

3

2

1

= 24