Recursion Worksheet

Let's consider exponentiation.

\[ 2^3 = 2 \times 2 \times 2 \]

What is the equation for \( 2^2 \)?

Rewrite the expression for \( 2^3 \) using \( 2^2 \).

Write a recursive expression for \( 2^n \), where \( n > 0 \).

What is \( 2^0 \)?

Write a method that computes powers of 2 recursively:

```java
public int powerOf2 (int exponent) {
    // Base case

    // Recursive case
}
```
Now, consider a more general exponentiation problem. Write a recursive expression to evaluate $m^3$.

Write a recursive expression for $m^n$, where $n > 0$.

What is $m^0$?

Write a method that computes powers recursively:

```java
public int power (int base, int exponent) {
    // Base case

    // Recursive case
}
```
Consider this recursive drawing:

What is the base case?

What is the recursive case?

What is the pseudocode for this method to draw these nested rectangles?

```java
public void drawRectangles(Point lowerLeft, double size, Color aColor, Graphics g) {
    // Base case

    // Recursive case
}
```