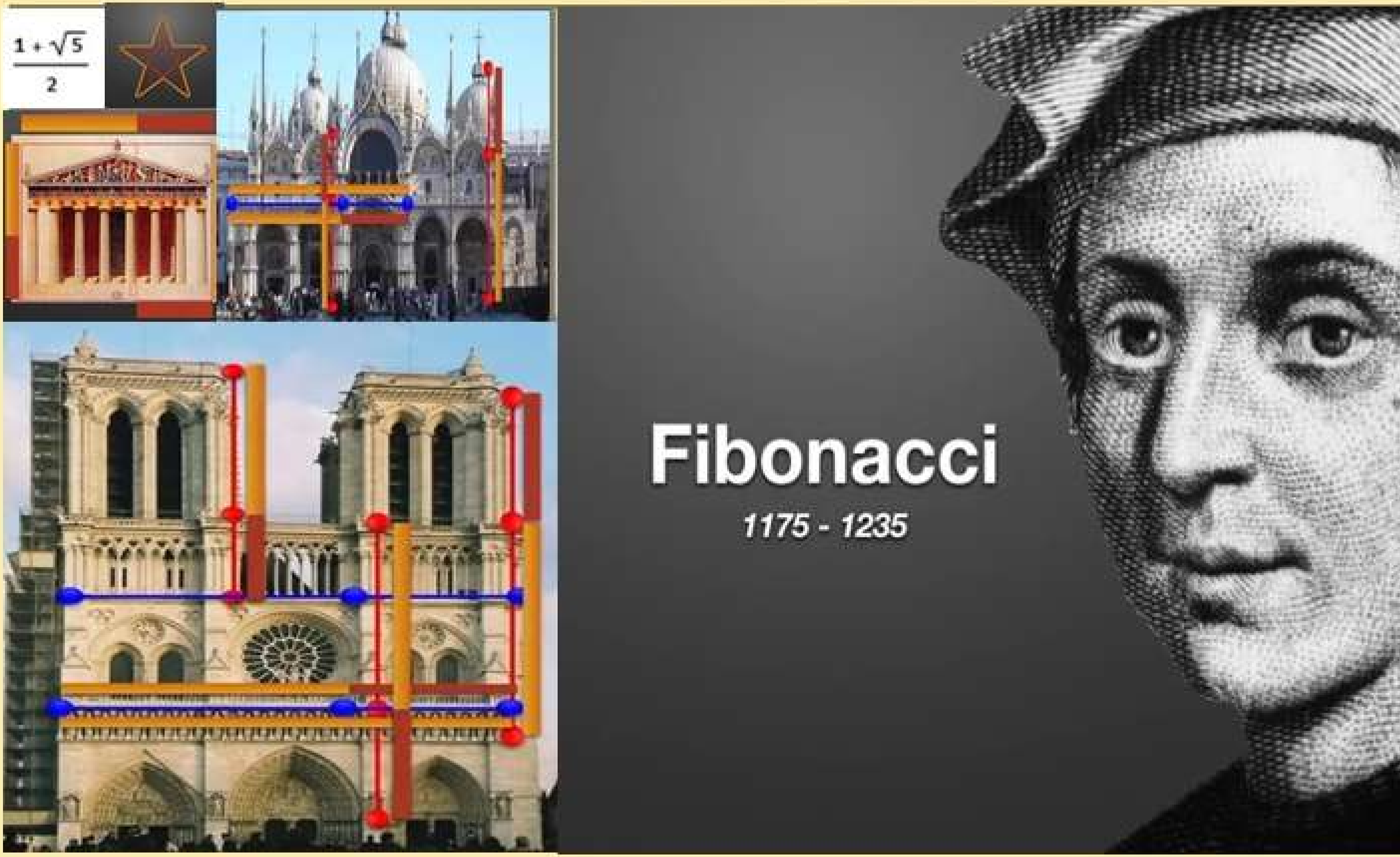
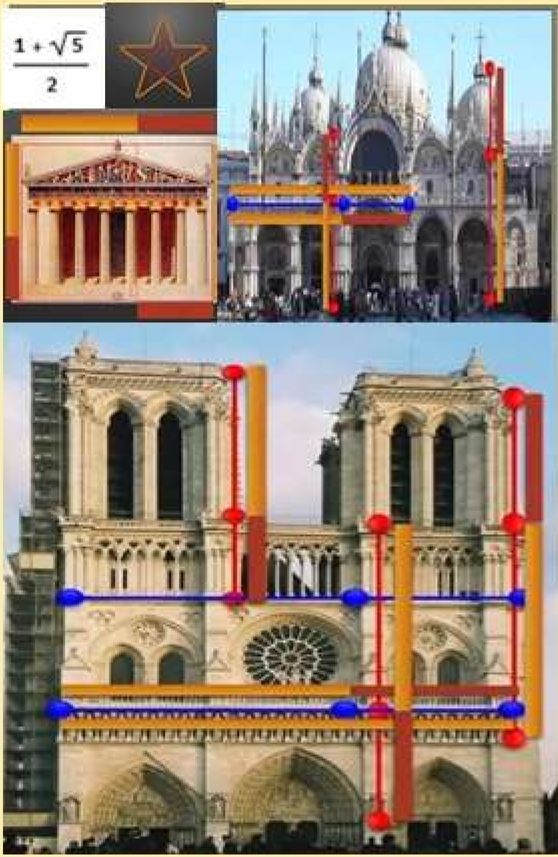

$\frac{1+\sqrt{5}}{2}$
Fibonacci
1175 - 1235




8


8

5


$\frac{1+\sqrt{5}}{2}$
3
5
8


$\frac{1+\sqrt{5}}{2}$
2
3
5
8


1 + √5
2
1
2
3
5
8


1
1
2
3
5
8

# Consideramos agoras as áreas

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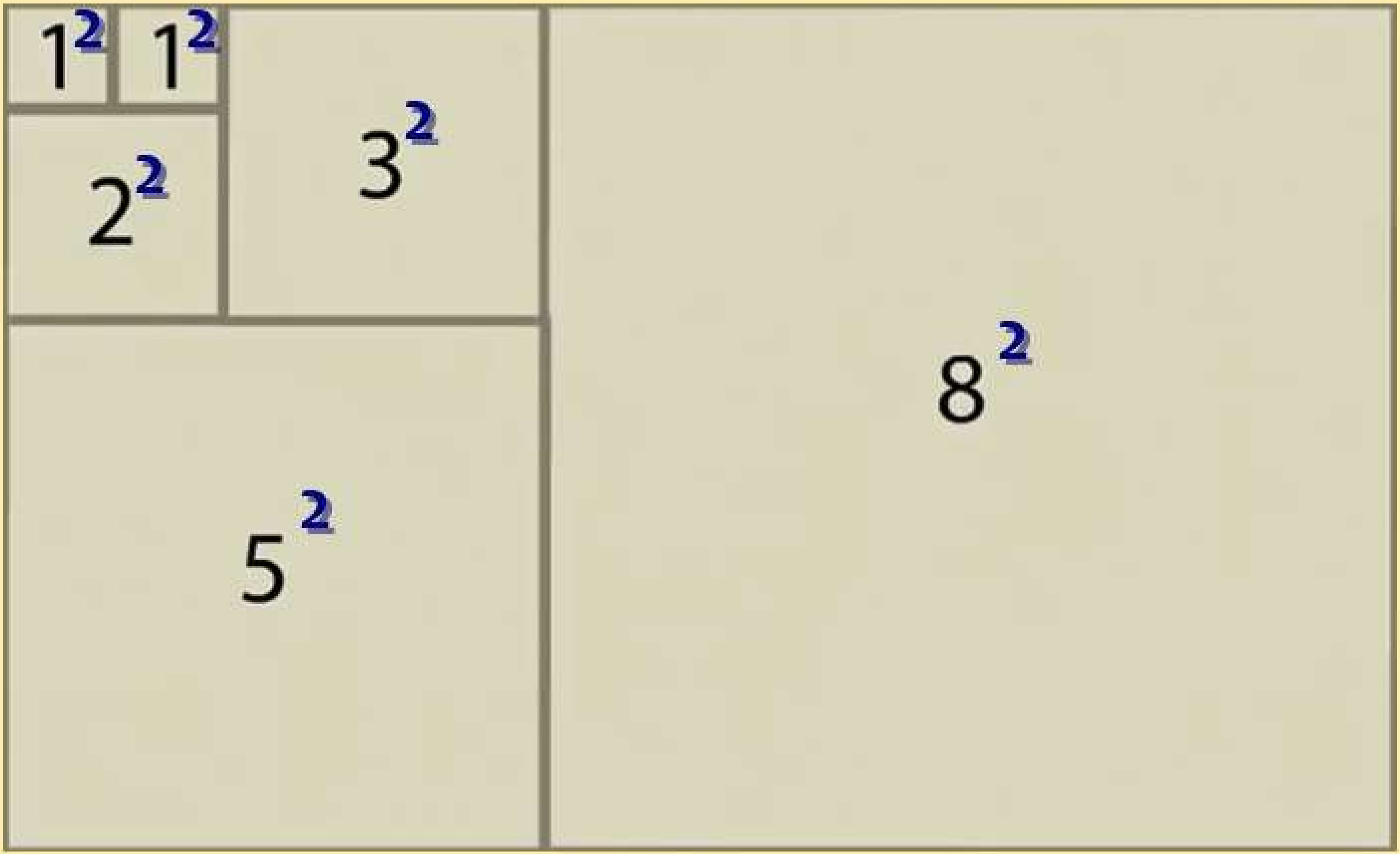

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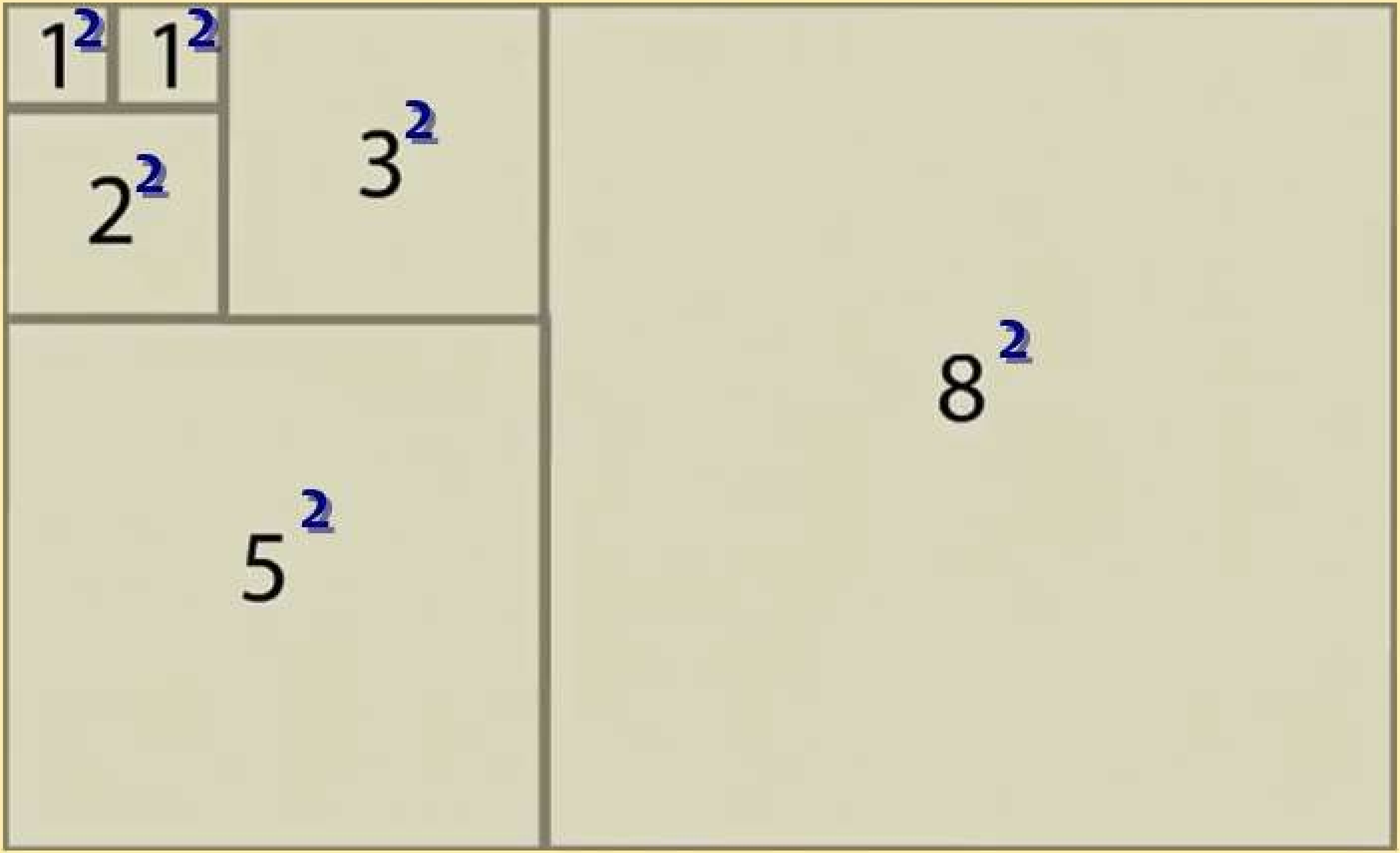
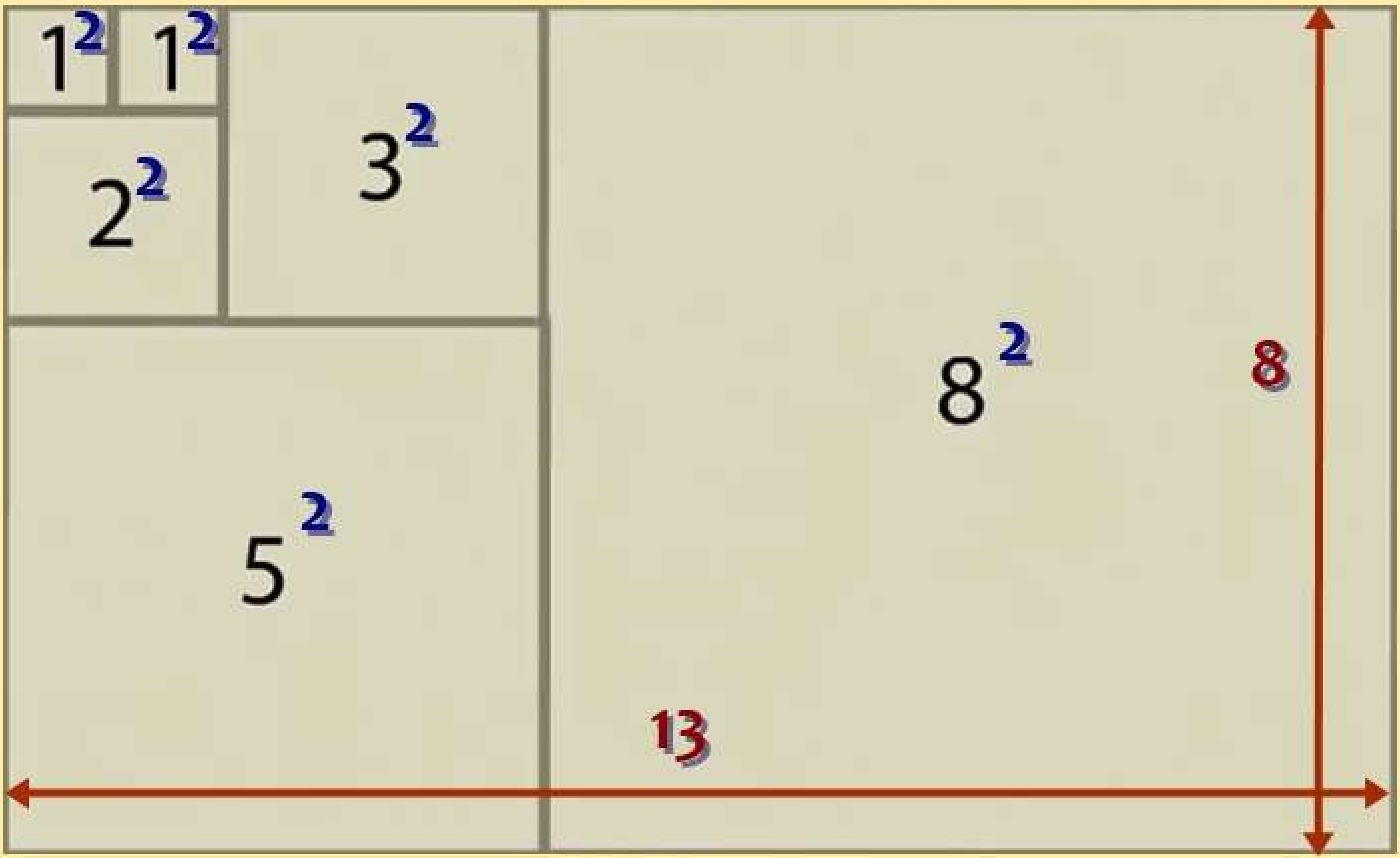


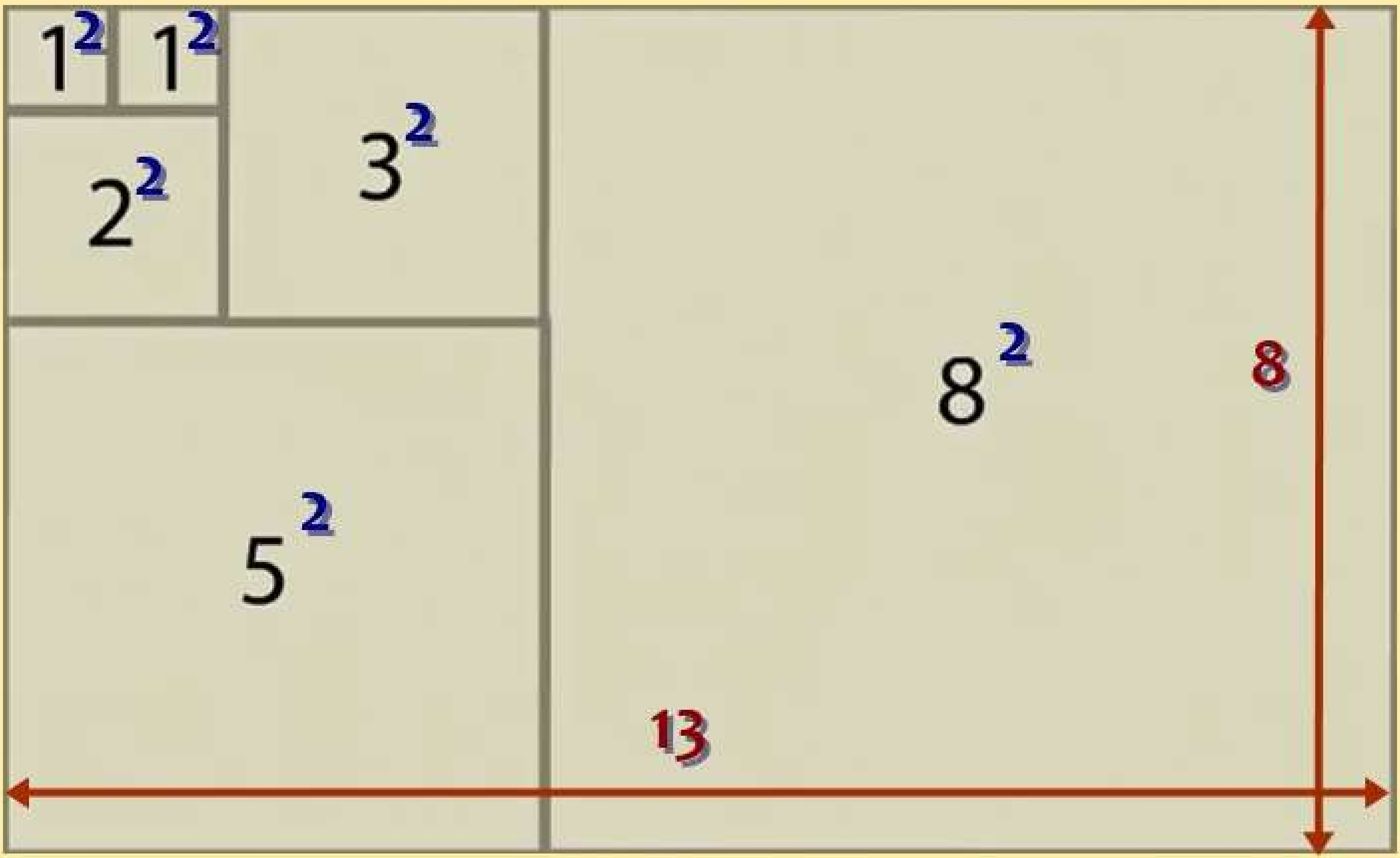

$$1 + 1 + 4 + 9 + 25 + 64 = 104$$

# Consideramos agoras as áreas




$$1 + 1 + 4 + 9 + 25 + 64 = 104$$

# Consideramos agoras as áreas




$$1 + 1 + 4 + 9 + 25 + 64 = 104$$

$$13 \times 8 = 104$$

# The Fibonacci Numbers

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 2 | 3 | 5 | 8 | 13 | 21 | 34 | 55 | ... |
| 1 | 1 | 4 | 9 | 25 | 64 | 169 | 441 | 1156 | 3025 | ... |

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$$1 + 1 + 4 = 6 = 2 \times 3$$

$$1 + 1 + 4 + 9 = 15 = 3 \times 5$$

$$1 + 1 + 4 + 9 + 25 = 40 = 5 \times 8$$

$$1 + 1 + 4 + 9 + 25 + 64 = 104 = 8 \times 13$$

$$1^2 + 1^2 + 2^2 + 3^2 + 5^2 + 8^2 = 8 \times 13$$

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**indução**

$n=1 \quad F(1)^2 = F(1) \times F(2)$

$1^2 = 1 \times 1$ ok

$n=2 \quad F(1)^2 + F(2)^2 = F(2) \times F(3)$

$1^2 + 1^2 = 1 \times 2$ ok

$n=3 \quad F(1)^2 + F(2)^2 + F(3)^2 = F(3) \times F(4)$

$1^2 + 1^2 + 2^2 = 2 \times 3$ ok

## Fibonacci série: $F(n) + F(n+1) = F(n+2)$

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válido para $n=k$ e provaremos verdadeiro para $n=k+1$

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$$\underbrace{F(k) \times F(k+1) + F(k+1)^2}_{[F(k) + F(k+1)] \times F(k+1)} = F(k+2) \times F(k+1)$$

ok!