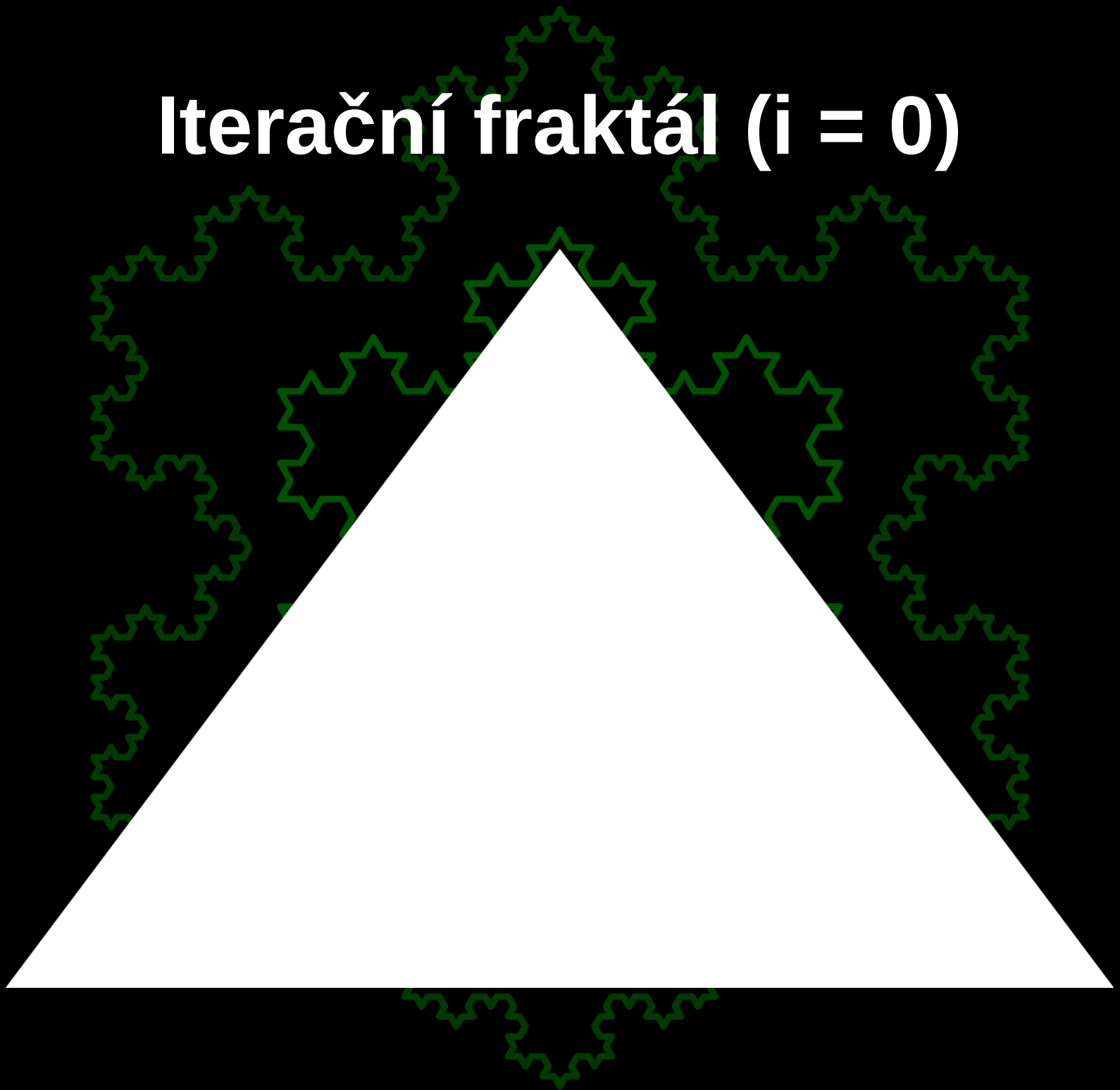


Dimenze iteračních fraktálů

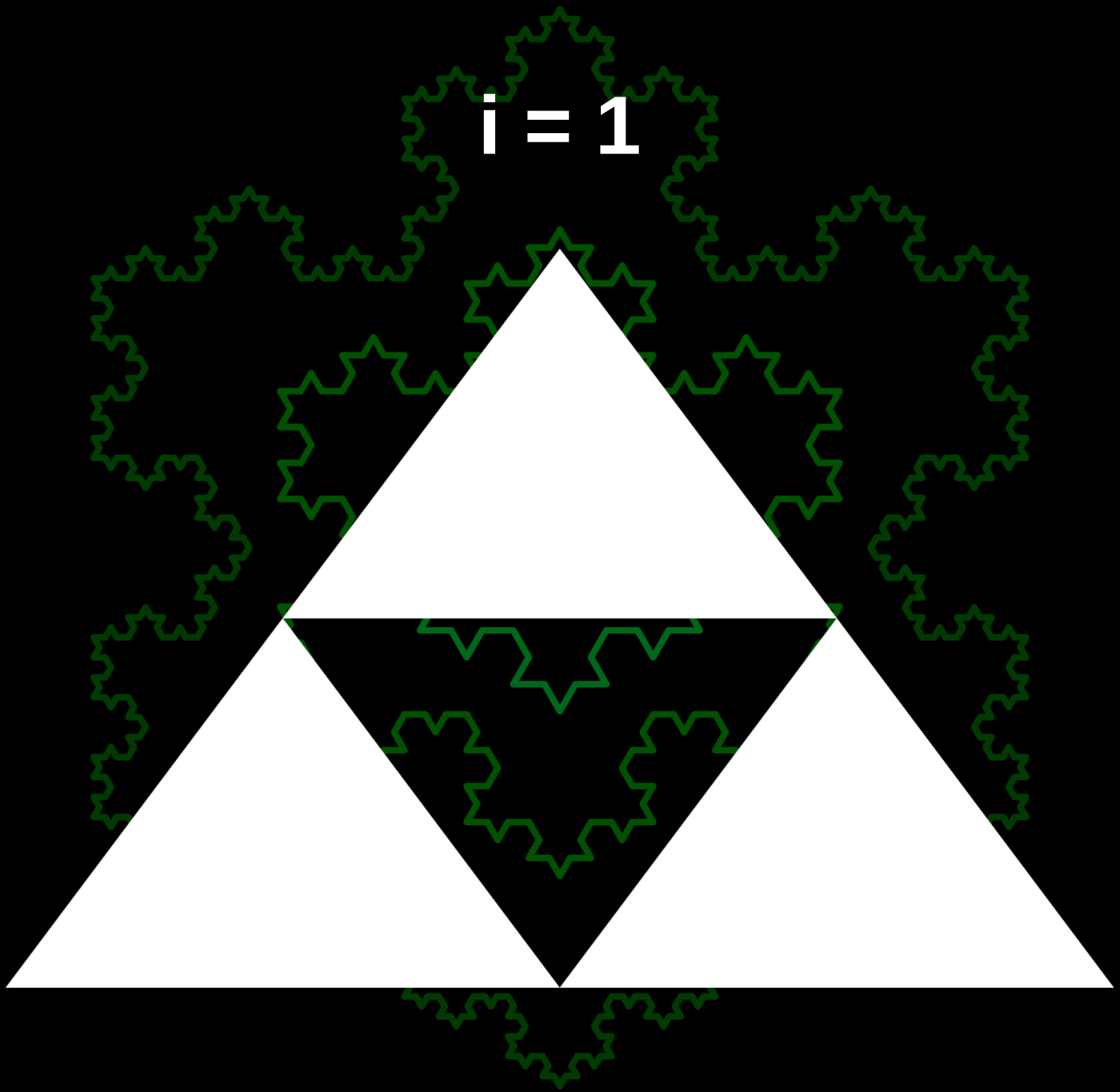


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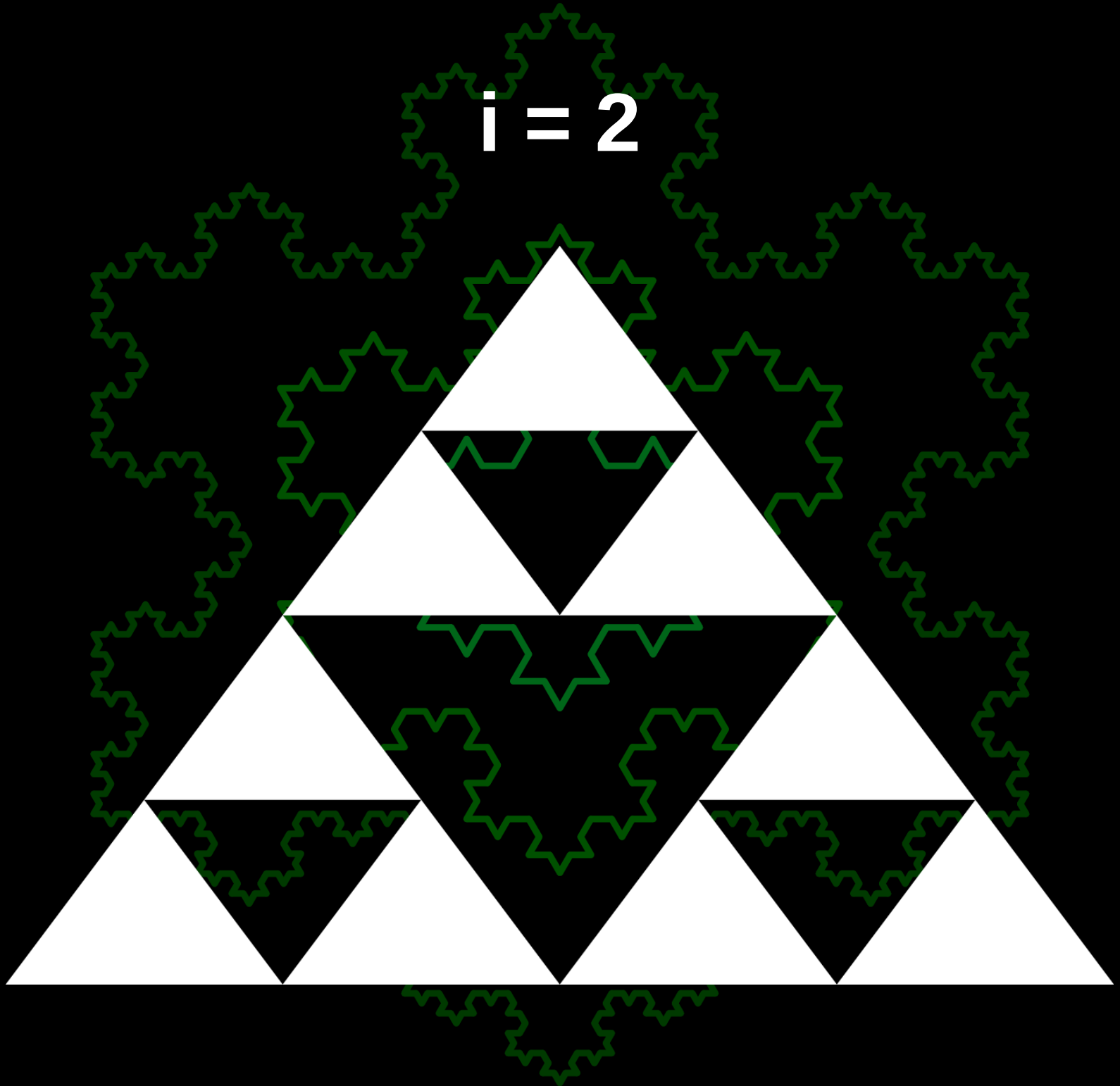
Iterační fraktál ($i = 0$)



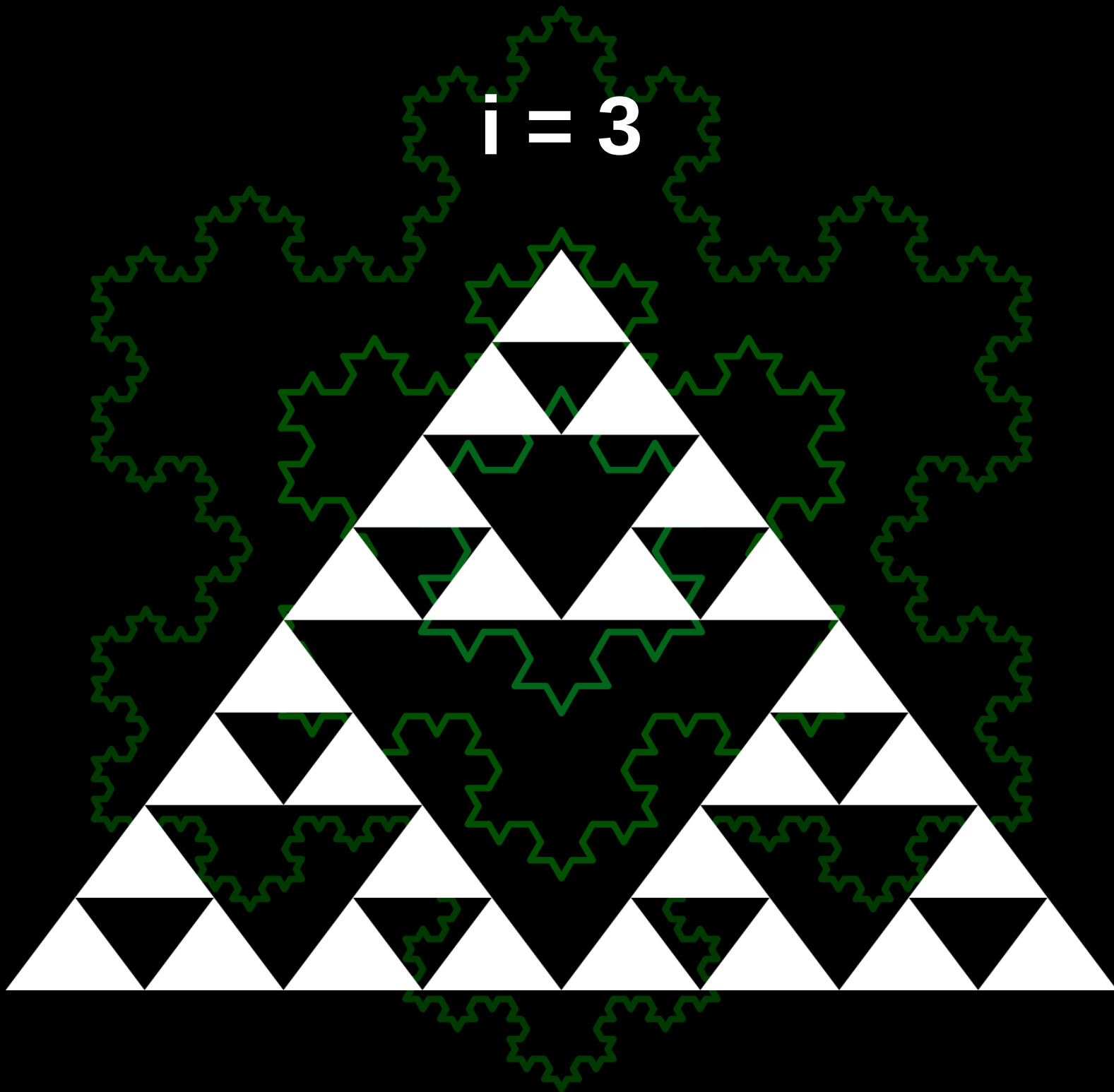
$i = 1$



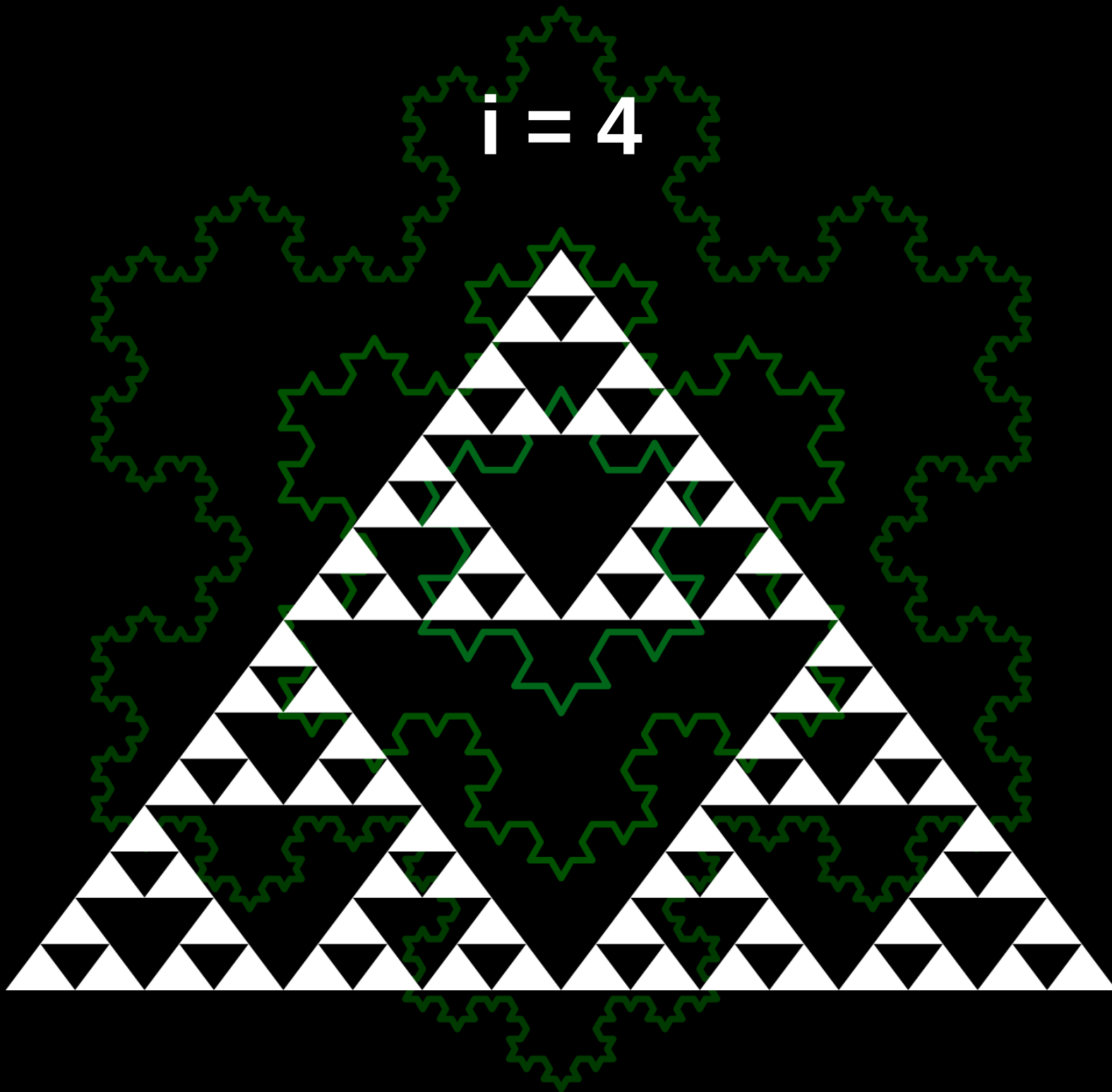
$i = 2$



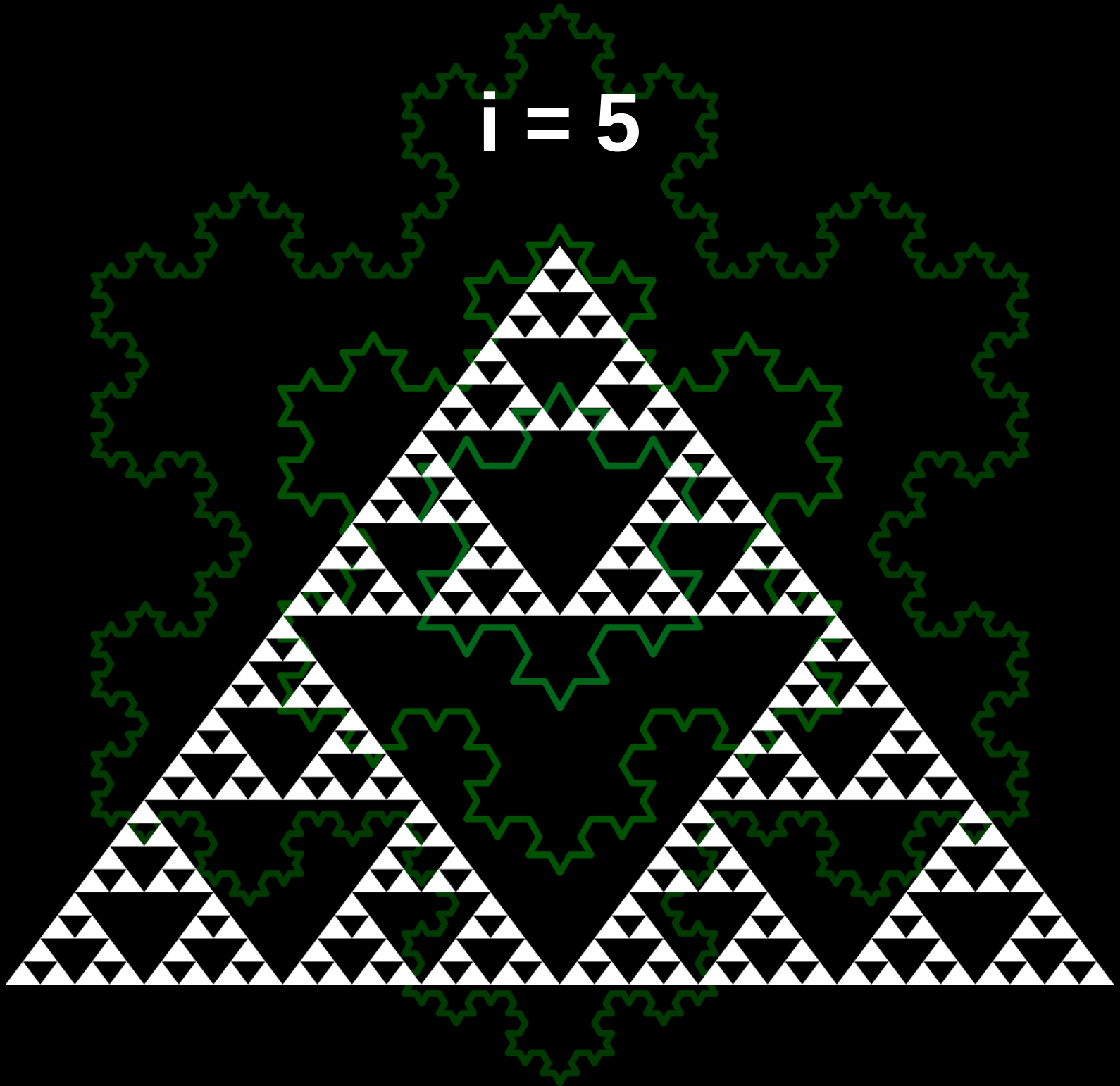
$i = 3$



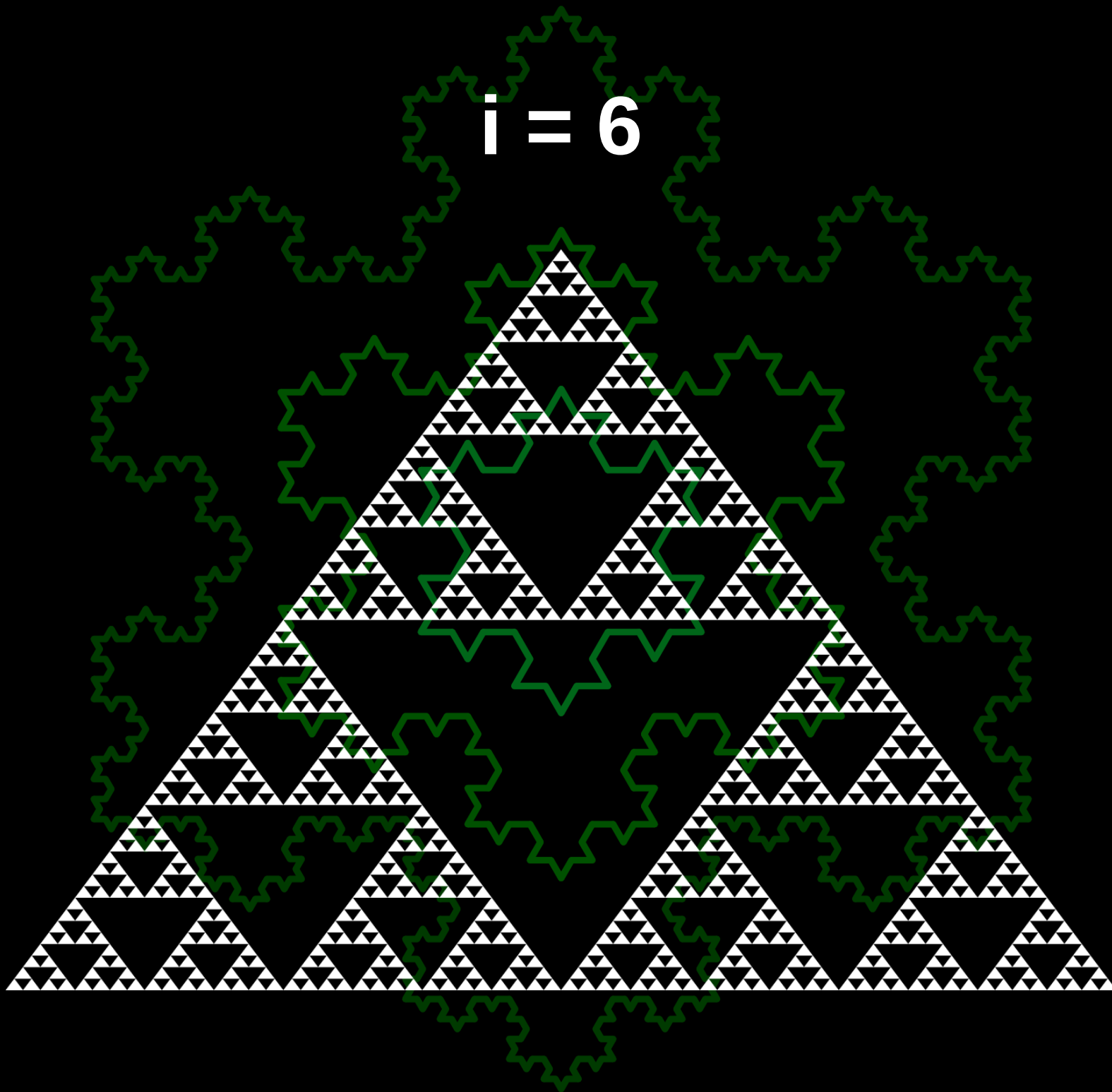
$i = 4$



$i = 5$



$i = 6$



Co je to fraktální dimenze?



Dimenze čtverce

$$n = 9$$

počet částí

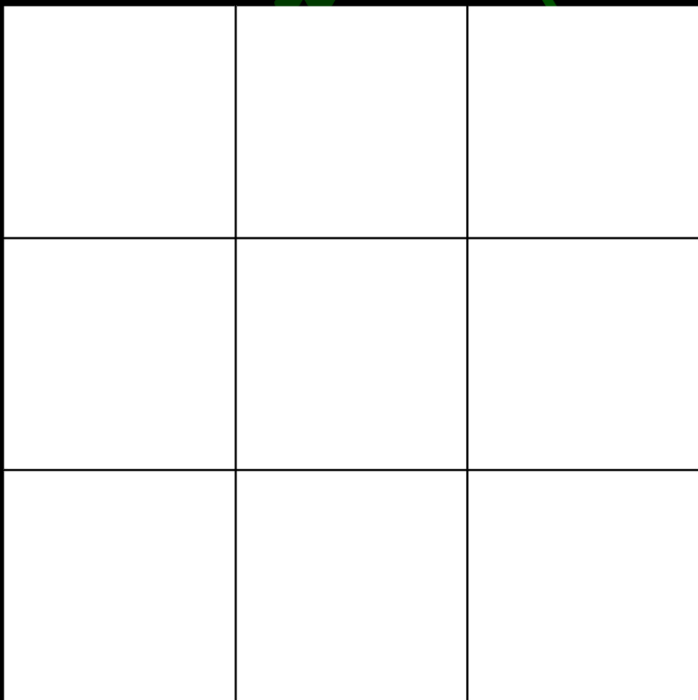
$$s = 1/3$$

faktor zmenšení

$$D = 2$$

dimenze

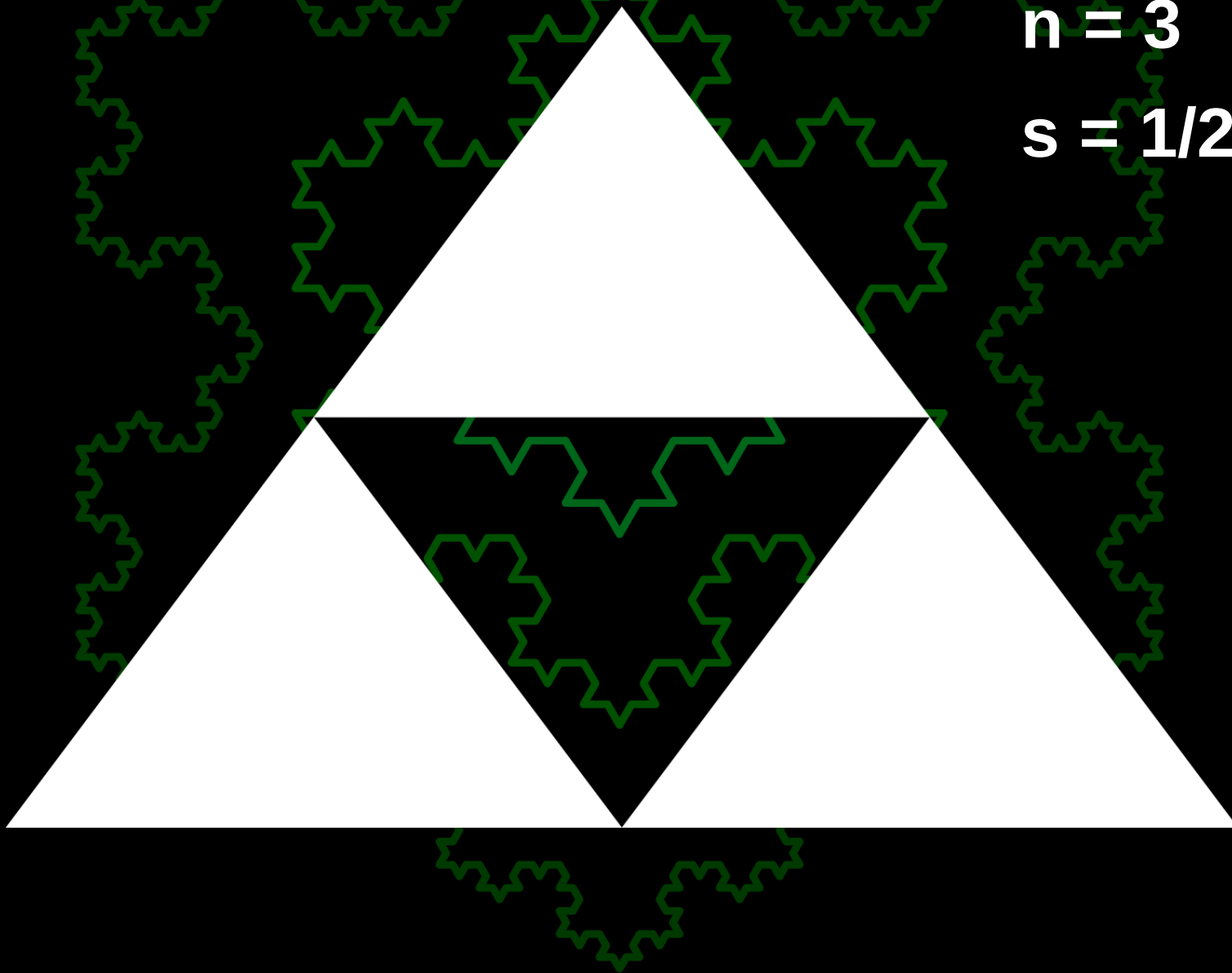
$$D = -\log(n)/\log(s)$$



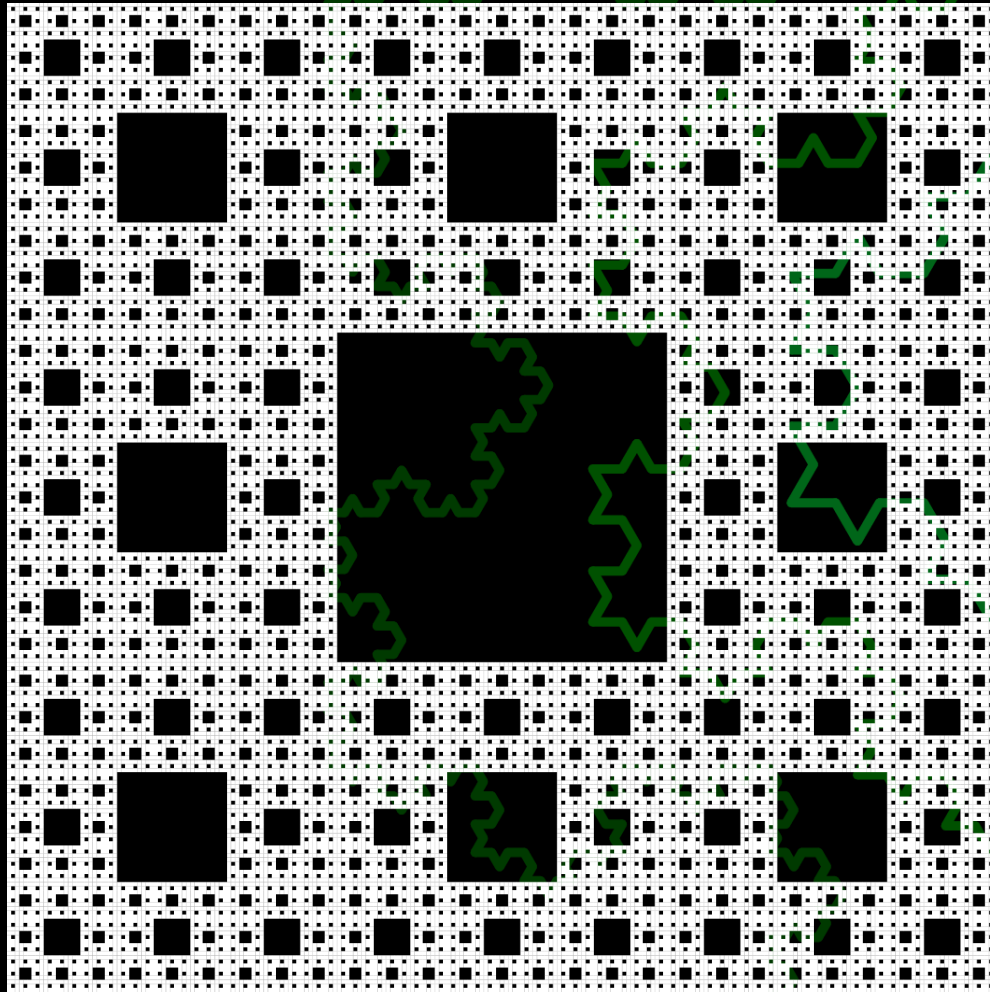
Dimenze Sierpinského trojúhelníku

$$n = 3$$

$$s = 1/2$$



Dimenze Sierpinského koberce



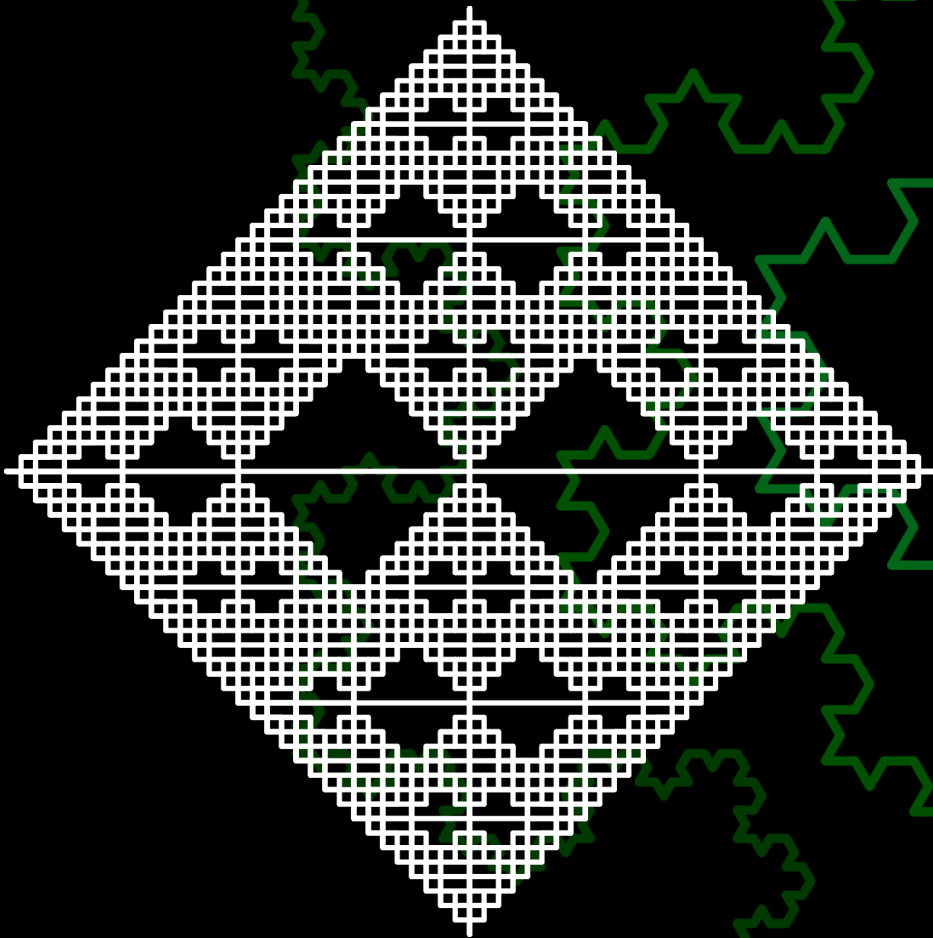
$$n = 8$$

$$s = 1/3$$

Dimenze rekurzivního kříže

$$n = 4$$

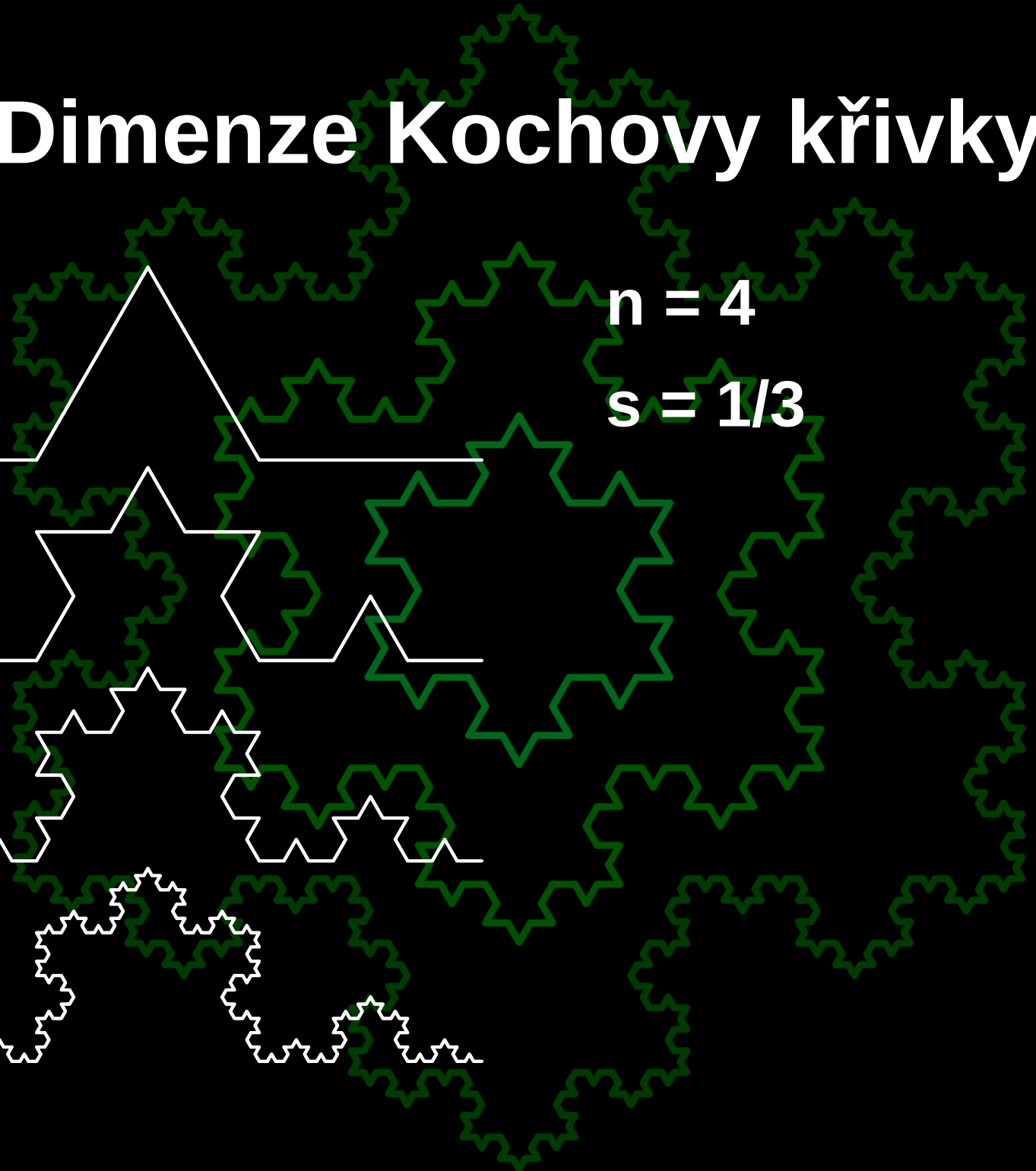
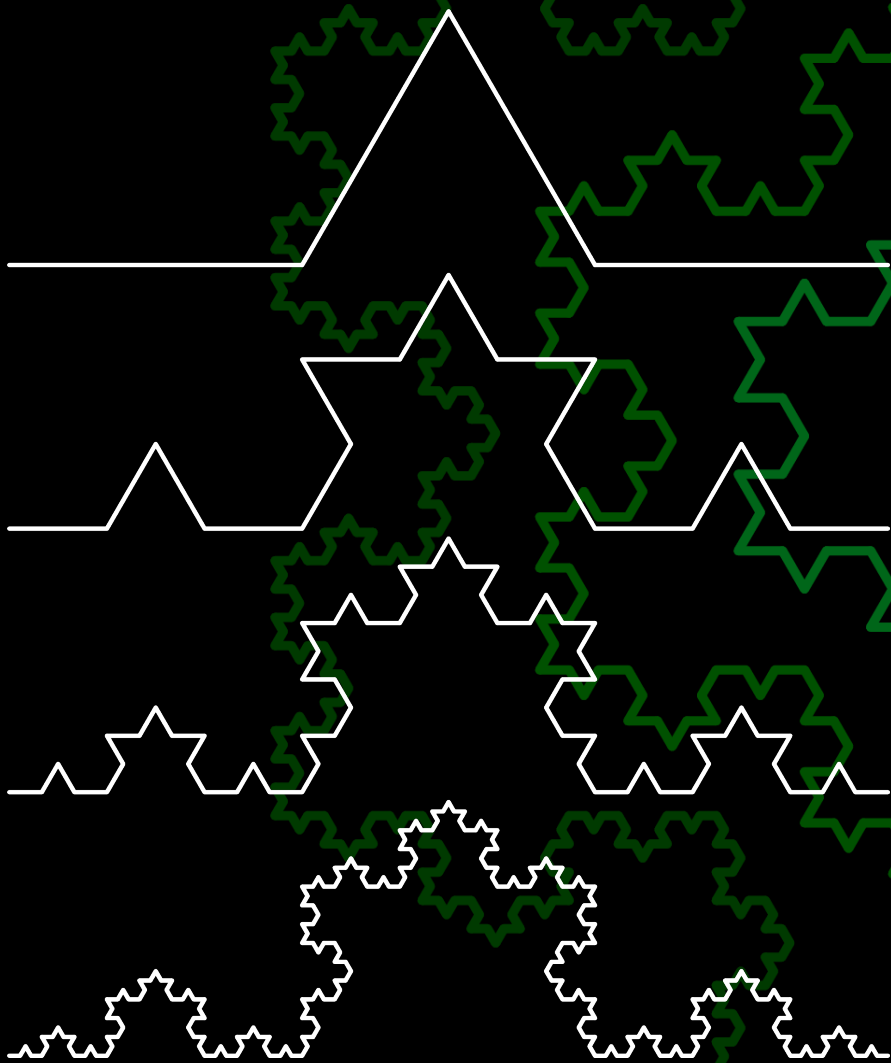
$$s = 1/2$$



Dimenze Kochovy křivky

$$n = 4$$

$$s = 1/3$$



Kochova hvězda – kód

```
void koch_curve(pair X, real s, real uhel, int n, pen color)
{
    if (n>0) {
        pair Y=X+(s*cos(uhel)/3, s*sin(uhel)/3);
        koch_curve(X, s/3, uhel, n-1, color);
        koch_curve(Y, s/3, uhel+pi/3, n-1, color);
        koch_curve(Y+(s*cos(uhel+pi/3)/3, s*sin(uhel+pi/3)/3), s/3, uhel-pi/3, n-1, color);
        koch_curve(X+2*(s*cos(uhel)/3, s*sin(uhel)/3), s/3, uhel, n-1, color);
    } else {
        pair Y = X+(s*cos(uhel), s*sin(uhel));
        draw(X--Y, color);
    }
}

void koch(pair X, real s, int iter, pen color)
{
    koch_curve(X+(s,0), s, pi, iter, color);
    koch_curve(X+(s*cos(pi/3), s*sin(pi/3)), s, -pi/3, iter, color);
    koch_curve(X, s, pi/3, iter, color);
}

fill((-0.3,-0.31)--(-0.3,0.89)--(1.3,0.89)--(1.3,-0.31)--cycle, black);
koch((0, 0), 1, 4, rgb(0,0, 0));
koch((0.20, 0.11), 0.6, 3, rgb(0.1, 0.32, 0));
koch((0.35, 0.2), 0.3, 2, rgb(0.1, 0.4, 0.1));
```

Dimenze iteračních fraktálů vám spočítali:

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