

Tiling Mathematics Reference

Mathematical foundations of seamless SVG pattern design

Translation tiling (p1)

Simplest symmetry: repeat one motif by translation only. Tile box width/height define the repeat unit.

Hexagonal tile geometry

Tile width = $r * \sqrt{3}$ = $r * 1.732$. Tile height = $r * 2$. Row offset = $\text{tile_width} / 2$.

Vert stride = $\text{tile_height} * 0.75$.

Brick offset formula

Each row shifts by $\text{tile_width} / 2$. SVG tile height = $2 * \text{brick_height}$. Offset row: $x = -\text{tile_width}/2$ to tile_width .

Diagonal rotation

`patternTransform="rotate(45)"` rotates entire tile grid. Tile size should be $\sqrt{2} * \text{desired-visual-size}$.

17 Wallpaper Groups

p1: translation only. p2: 2-fold rotation. pm: mirrors. pg: glide reflection. cm: mirror s+glide. p4: 4-fold. p6: 6-fold.

Corner rule

Shapes at corners must appear in all four corners each as a partial shape. All four quarters = one full shape.

Edge continuity

Any shape crossing the right edge must reappear from the left edge at exactly the same y position. Same for top/bottom.