

What is hiding inside the number 3?

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So what is hiding inside the number 3? Well, consider:

$3 = \sqrt{9}$	$\# 3 = \sqrt{9}$
$= \sqrt{1+8}$	$\# 9 = 1+8$
$= \sqrt{1+2*4}$	$\# 8 = 2*4$
$= \sqrt{1+2\sqrt{16}}$	$\# 4 = \sqrt{16}$
$= \sqrt{1+2\sqrt{1+15}}$	$\# 16 = 1+15$
$= \sqrt{1+2\sqrt{1+3*5}}$	$\# 15 = 3*5$
$= \sqrt{1+2\sqrt{1+3\sqrt{25}}}$	$\# 5 = \sqrt{25}$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+24}}}$	$\# 25 = 1+24$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+4*6}}}$	$\# 24 = 4*6$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{36}}}}$	$\# 6 = \sqrt{36}$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+35}}}}$	$\# 36 = 1+35$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+5*7}}}}$	$\# 35 = 5*7$
$= \sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+5\sqrt{49}}}}}$	$\# 7 = \sqrt{49}$
$= \dots$	$\# 49 = 1+48, 48 = 6*8, 8 = \sqrt{64}, \dots$

and so apparently $3 = \sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{1+5\sqrt{1+6\sqrt{64}}}}}} \dots$