

From wiki:

$$w = \left\lfloor \frac{\sqrt{8z+1} - 1}{2} \right\rfloor = \left\lfloor \sqrt{\frac{8z+1}{4}} - \frac{1}{2} \right\rfloor \in \left\{ \left\lfloor \sqrt{\frac{8z+1}{4}} \right\rfloor, \left\lfloor \sqrt{\frac{8z+1}{4}} \right\rfloor - 1 \right\},$$

depending on whether the first decimal of  $\sqrt{\frac{8z+1}{4}}$  is  $\geq$  or  $<$  to 0.5 respectively. The first decimal is the last digit of

$$10 \cdot \sqrt{\frac{8z+1}{4}} = \sqrt{100 \cdot \frac{8z+1}{4}} = \sqrt{25(8z+1)}.$$

Lastly, as **isqrt** operates on positive integers ( $//$  is integer division):

$$\left\lfloor \sqrt{\frac{8z+1}{4}} \right\rfloor = \left\lfloor 10 \cdot \sqrt{\frac{8z+1}{4}} \right\rfloor // 10 = \left\lfloor \sqrt{25(8z+1)} \right\rfloor // 10 = \mathbf{isqrt}(25(8z+1)) // 10$$