8. Invariant $pow = a^i$.

Base case. At the start of 1st iteration, $i=1$ $pow=1$.

in the inner loop, $pow = pow * a = 1 * a = a = a^1$

invariant hold in the Base case.

Induction hypothesis: At the start of $k+1$ of the loop, $i = k+1$

Assuming that $pow = a^k$ is tru for $k = i$.

In the inner loop.

$$pow = pow * a = a^k * a = a^{k+1}$$

Therefore the invariant holds at the end of $k+1$ of the loop.

And the invariant holds at begginning of $k+2$ loop.

Loop termination: the loop ends after n iterations.

We were about to enter $i = n+1$ iterations.

Therefore, by invariant, when the loops, $pow = a^i = a^n$.