Case A) $(k+1) \bmod 3 = 0$

According to the non-recusive formula:

$$f(k+1) = 2^{[(k+1)/3]}$$

According to the recursive formula:

$$f(k+1) = 2\,f((k+1)-3)$$

$$= 2\,f(k-2)$$

$$= 2\left(2^{(k-2)/3}\right)$$

Justification:

According to the inductive assumption, the non-recursive and recursive formulas are equivalent for $n \leq k$. Thus, we can substitute the non-recursive function definition for $f(k-2)$.

Since we know that $(k+1) \bmod 3 = 0$,

it must be true that $((k+1)-3) \bmod 3 = 0$

and $(k-2) \bmod 3 = 0$

Thus, $f(k-2) = 2^{(k-2)/3}$

$$= 2^{[(k-2)/3 + 1]}$$

$$= 2^{[(k-2+3)/3]}$$

$$= 2^{[(k+1)/3]}$$

Therefore, for case A the recursive and non-recursive formulas are equivalent.