

# Discrete Mathematics

## Problem Set 5

2. Show that  $f_1 + f_3 + f_5 + \dots + f_{2n-1} = f_{2n}$  for  $n \geq 1$

- **Base case:**  $n = 1$

- $f_1 = f_{2*1}$
  - $1 = 1$

- **Inductive hypothesis:** Assume

- $f_1 + f_3 + f_5 + \dots + f_{2k-1} = f_{2k}$

- **Inductive step:** Prove

- $f_1 + f_3 + f_5 + \dots + f_{2k-1} + f_{2(k+1)-1} = f_{2(k+1)}$
  - $f_1 + f_3 + f_5 + \dots + f_{2k-1} + f_{2k+1} = f_{2k+2}$

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## Problem Set 5

- **Inductive hypothesis:** Assume

$$- f_1 + f_3 + f_5 + \dots + f_{2k-1} = f_{2k}$$

- **Inductive step:** Prove

$$- f_1 + f_3 + f_5 + \dots + f_{2k-1} + f_{2k+1} = f_{2k+2}$$


$$- f_{2k} + f_{2k+1} = f_{2k+2}$$

- True by definition of  $f_{2k+2}$