

Assignment 4.

1. Base step: $n=1$

$$f_{n-1} \cdot f_{n+1} - f_n^2 = 0 \cdot 2 - (1^2) = -1$$

$$(-1)^n = (-1)^1 = -1$$

$$-1 = -1$$

Inductive Hypothesis: $f_{k+1} \cdot f_{k-1} - f_k^2 = (-1)^k$ is true for some $k \geq 0$

Inductive step: $n=k+1$

by definition: $f_{k+1-1} \cdot f_{k+1+1} - f_{k+1}^2 = f_k \cdot f_{k+2} - f_{k+1}^2$

$$f_k \cdot f_{k+2} - f_{k+1}^2 = (-1)^{k+1}$$

$$f_{k^2+2} - f_{k^2+1} = (-1)^{k+1}$$

$$(-1)^{k+1} = (-1)^{k+1}$$

$$\text{LHS} = \text{RHS}$$