$$\prod_{t=2}^{\infty} 1 - \frac{1}{t} = \frac{n+1}{2n} t$$

Base Case:

$$t = n = 2$$

$$1 - \frac{1}{2^2} = \frac{2+1}{2(2)}$$

$$1 - \frac{1}{4} = \frac{3}{4}$$

$$\frac{3}{4} = \frac{3}{4}$$

Hypothesis:

$\prod 1 - \frac{1}{k^2} = \frac{k+1}{2k}$ is TRUE for $k \geq 2$

Proof:

$$\prod 1 - \frac{1}{k^2} \cdot \left(1 - \frac{1}{(k+1)^2}\right) = \frac{k+1+1}{2(k+1)}$$

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

$$(k+1)(k+1) - 1 = \frac{2k(k+2)}{2}$$

$$2(k+1)(k+1) - 2 = 2k(k+2)$$

$$2(k^2 + 2k + 1) - 2 = 2k^2 + 4k$$

$$2k^2 + 4k + 2 - 2 = 2k^2 + 4k$$

$$2k^2 + 4k = 2k^2 + 4k \checkmark$$