FUN MATH KIDS

Easy

Proof by Induction Word Problems

Topic: Structure inductive proof step by step · Grade: grade 8

Name: _____ Date: _____ Score: _____/ 5

For each statement, structure the proof and verify the base case n = 1.

1. Prove by induction that $1^2 + 2^2 + \ldots + n^2 = n(n+1)(2n+1)/6$. Verify the base case $n = 1$.

Answer: _____

2. Prove by induction that $1 + 3 + 5 + \ldots + (2n-1) = n^2$. Verify the base case $n = 1$.

Answer: _____

3. Prove by induction that $1 \cdot 2 + 2 \cdot 3 + \ldots + n(n+1) = n(n+1)(n+2)/3$. Verify the base case $n = 1$.

Answer: _____

4. Prove by induction that $1^3 + 2^3 + \ldots + n^3 = [n(n+1)/2]^2$. Verify the base case $n = 1$.

Answer: _____

5. Prove by induction that $n^3 - n$ is divisible by 3 for all $n \geq 1$. Verify the base case $n = 1$.

Answer: _____