1.4 – Proof: Deductive Reasoning

Ex. Conjecture: The sum of two consecutive integers is always odd.

We could ***validate*** this with inductive reasoning (find some examples to show that it works) but to **PROVE** it we need to use deductive reasoning.

Proof – a mathematical argument showing all cases are valid and no counterexample exists.

Deductive reasoning – when conclusions are validated through logical means, based on premises that are assumed to be true (could be two column proof, one column proof, venn diagram etc.)

Example from above:

Inductive *Deductive*

Example: All humans are mortal. Jane is human. What can you conclude about Jane? Give a proof.

Example: Choose a number. Multiply by 6. Add 14. Divide by 2. Add 5. Divide by 3. Subtract your original number.

Conjecture:

Proof:

Pg 31 # 5,7,8,16,17,20

1.4 – More Proofs

Ex. Conjecture: The sum of consecutive perfect squares is always an odd number.

Do some examples
to validate (check)

Proof:

Ex. Prove that any two-digit number that ends in 5 or 0 is divisible by 5.

Validate:

Proof:

Ex. Prove that any multiple of 6, once squared, is divisible by 9.

Validate:

Proof:

Ex. Prove that $n^2 + n + 1$ is always odd for any natural number.

Validate:

Proof:

Pg 32 # 19, Pg 35 #8-11