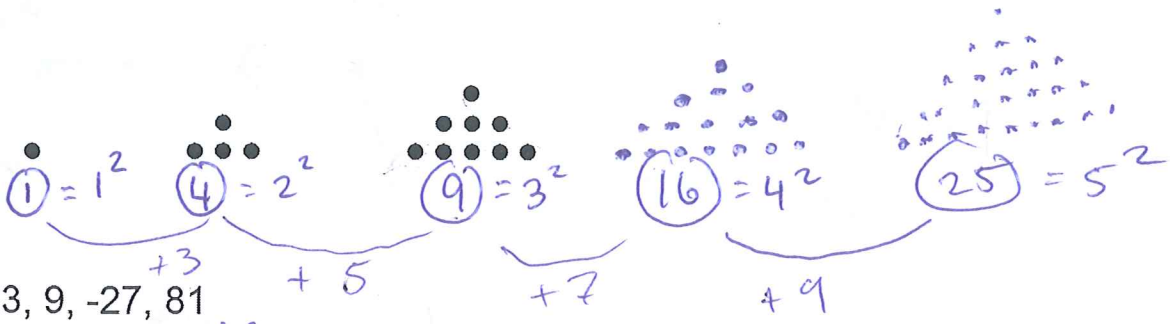
Geometry - 2.1 - Inductive Reasoning and Conjecture

- A Conjecture is an educated guess based on known information.
- Inductive Reasoning uses a number of specific examples to arrive at a plausible generalization or prediction.

Ex 1 - Make a conjecture about the next item in each sequence.

a)



b) 1, -3, 9, -27, 81

×-3 ×-3 ×-3 ×-3 ×-3

Next: -243

Pattern: mult. by -3

Ex 2 - Goldbach's Conjecture states that every even integer greater than 2 can be written as the sum of two prime numbers. Show this conjecture is true for the first ten even numbers greater than 2.

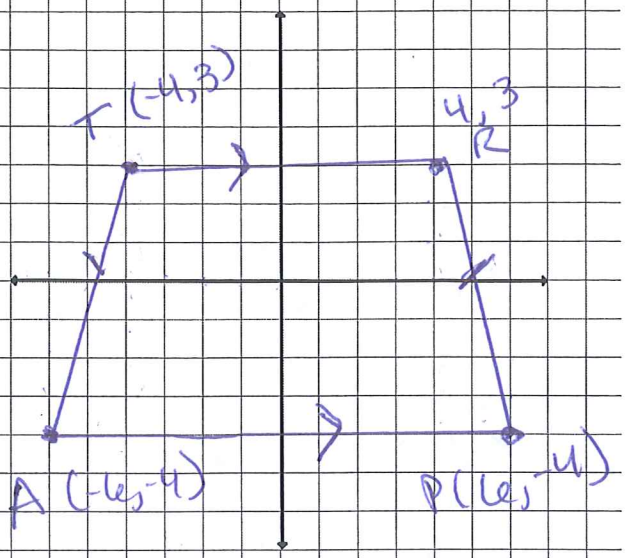
4 = 2+2
6 = 3+3
8 = 3+5
10 = 5+5
12 = 5+7
14 = 7+7
16 = 5+11
18 = 5+13
20 = 7+13
22 = 5+17

We have Not Proven this for all cases

4,000,000,000,000,000,000,000

Ex 3 - Make a conjecture about the following coordinates, using the graph below to illustrate your conjecture:

T(-4, 3), R(4, 3), A(-6, -4), P(6, -4)



TRAP is an isoseles Trapezoid

- A Counter example is a false example that shows that a conjecture is not true.

Ex 4 - Provide a counterexample to the following conjecture:

"If x and y are real numbers where x > 0 and y > 0, then xy > 1."

Hypothesis is true

conclusion is false

IF x = 2 and y = 3, then x · y = 6

IF x = 10 and y = 18 then x · y = 180

IF x = 4 and y = 6 then x · y = 24

IF x = 1.2 and y = 3.5, then x · y = 4.2

Counter example

IF x = .5 and y = .3

then x · y = .15 = Disproves conclusion