

Geometry

Recognize Patterns



$$1, 4, 9, 16, 25.$$

$$1^2, 2^2, 3^2, 4^2, 5^2$$

$$2, 0, -2, 0, 2, \dots$$

Conjecture - Statement
based on observation

Inductive Reasoning

$$- \quad = - \quad = - \quad = - \quad = -$$

$$\text{If } x^2=9 \text{ then } x=\pm 3 \quad (-3)(-3)$$

Counterexample

1 example that shows
it does not work

All Left turns on
red are illegal

Sum of the first n ^{odd} integers

$$1 = 1^2$$

$$1 + 3 = 4 = 2^2$$

$$1 + 3 + 5 = 9 = 3^2$$

$$1 + 3 + 5 + 7 = 16 = 4^2$$

$$1 + 3 + 5 + 7 + 9 = 25 = 5^2$$

sum of the first n odd integers
is n^2

Product of consecutive integers

$$2(3) = 6 = 2^2 + 2$$

$$3(4) = 12 = 3^2 + 3$$

$$4(5) = 20 = 4^2 + 4$$

$$5(6) = 30 = 5^2 + 5$$

$$n(n+1) = n^2 + n$$

True

Every Even number is the sum of
two primes $n > 2$

$$10 = 7+3, 5+5$$

$$20 = 13+7, 17, 3$$

$$48 = 19+29$$

② ③ 4 ⑤ 6 ⑦ 8 9 10
11 20

A bus stops at 5th Street
every 15mins

Will you be at the
corner at the same time
as the bus when walking around
the block if it takes 7mins

P 6-8

2-42 even