Lezione 8

Esercizi

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$$(n+1)^3 + 5(n+1) = n^3 + 3n^2 + 3n + 1 + 5n + 5 = (n^3 + 5n)(3n^2 + 3n + 6)$$

Somma angoli:

180°

360°

540°
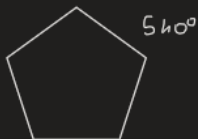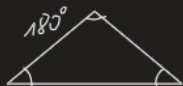
$$\forall n \geq 3$$

la somma degli angoli interni di un poligono convesso avendo n lati è $180°(n-2)$

Per ipo. ind. è div. per 6

$(3n^2 + 3n)$

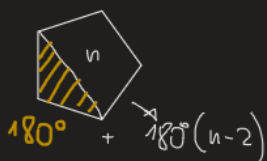div. per 3 → $3n(n+1)$

Una dei due è per forza pari: quindi div. per 6 ✓

<u>Dim</u>

$$180°(n-2) + 180°$$

$180°$ + $180(n-2)$

dim. somma $\measuredangle$ interni = $180°$

$$1 + 3 + 5 + 7 + \ldots + (2n-1)$$

n= 1   1
n= 2   4
n= 3   9
n= 4   16
n= 5   25

$$\sum_{i=0}^{n} 2i - 1 = n^2$$

$$\sum_{i=1}^{n+1} 2i - 1 = \sum_{i=0}^{n} 2i - 1 + 2(n+1) - 1 = n^2 + 2n + 1 = (n+1)^2$$

$\delta(0) = 0$

$\delta(n+1) = \delta(n) + 2n + 2$

$\downarrow$

$\forall n \ \delta(n) = n(n+1)$

0	0
1	2
2	6
3	12

$$\delta(n) = n(n+1)$$

$$\delta(n+1) \overset{\text{Des.}}{=} \underline{\delta(n) + 2n + 2} \overset{\text{Ipo. IND.}}{=} n(n+1) + 2n + 2 = n(n+1) + 2(n+1) = \underline{(n+1)(n+2)}$$

Siano $x, y \in \mathbb{N}$ $\quad x > y$

Dimostrare che $\forall n$, $x-y$ divide $x^n - y^n$

$$\delta(n) = \frac{x^n - y^n}{x - y}$$

$\downarrow$

$$\delta(0) = \frac{0}{x-y} \ \checkmark$$

$$\delta(n+1) = \frac{x^{n+1} - y^{n+1}}{(x-y)} = \frac{(x^n \cdot x) - (y^n \cdot y)}{} = \frac{x^n x - y^n y + x y^n - x y^n}{} =$$

$$\hookrightarrow \left[x(x^n - y^n) \right] + \left[y^n(x-y) \right]$$

divisibile   divisibile
per ipo. ind.