MASSIMO GOBBINO — PRECORSO

Titolo nota 17/09/2007

MA-GI pomeriggio

2 Fascicoletti

8:30 - 13:00 LU-VE

SEU

Servizio
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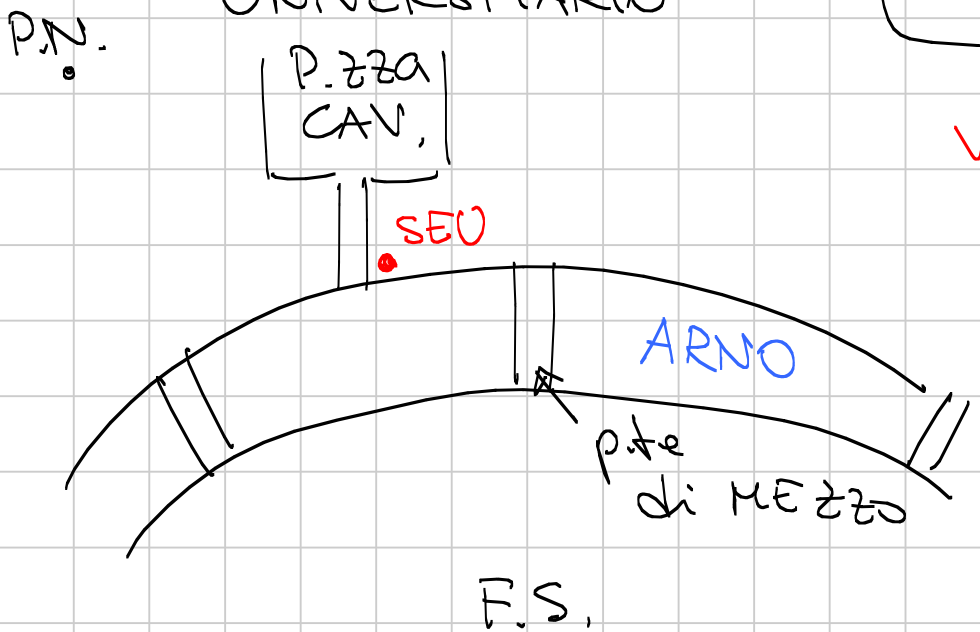
$$\frac{1}{a+b} = \frac{1}{a} + \frac{1}{b}$$

$$2^{30} + 2^{30} = 2^{60}$$



VIA CURTATONE E MONTANARA

1. Precorso di Matematica
2. ESERCIZI x PRECORSO

$a = \frac{1}{3}$ $\qquad \frac{a}{a+b} = \frac{1}{2}$ $\rightsquigarrow$ Trovare b

$$\frac{\frac{1}{3}}{\boxed{\frac{1}{3}+b}} = \frac{1}{2} \qquad \frac{1}{3} = \frac{1}{2}\left(\frac{1}{3}+b\right)$$

$$\frac{1}{3} = \boxed{\frac{1}{6}} + \frac{b}{2}$$

$$\frac{b}{2} = \frac{1}{3} - \frac{1}{6} = \frac{1}{6}$$

$$\frac{b}{\boxed{2}} = \frac{1}{6} \qquad b = \frac{1}{6} \cdot 2 = \frac{1}{3} \qquad b = \frac{1}{3}$$

$a = \frac{1}{3}$ $\qquad \frac{a}{\boxed{a+b}} = \boxed{\frac{1}{2}}$ $\qquad 2a = a+b \longrightarrow a = b$

Quindi $b = a = \frac{1}{3}$

$$\frac{a}{a+b} = \frac{1}{2} \qquad \frac{2a}{a+b} = 1 \qquad 2a = a+b$$

$$a+b = \frac{1}{3} \qquad \boxed{\frac{a}{b} = \frac{1}{2}}$$

$$2a = b \longrightarrow$$ sost. nella I eq. !

$$a+b = 3a = \frac{1}{3} \Rightarrow a = \frac{1}{9}$$

$$b = 2a = \frac{2}{9}$$

$a+b = \frac{1}{2}$ $\qquad$ $\frac{a}{a+b} = \frac{1}{3}$

1° modo: sost. la 1ª nella 2ª

$$\frac{a}{\frac{1}{2}} = \frac{1}{3} \longrightarrow 2a = \frac{1}{3} \rightarrow a = \frac{1}{6}$$

$$b = \frac{1}{2} - a = \frac{1}{2} - \frac{1}{6} = \frac{1}{3}$$

2° modo: mi lavoro la 2ª eq. $\qquad \frac{a}{a+b} = \frac{1}{3}$

$$3a = a+b$$

$$b = 2a$$

Sost. nella 1ª eq. $\qquad a+b = 3a = \frac{1}{3} \rightarrow a = \frac{1}{9}$

$x \geq 3 \implies x^2 > 0$ VERA

$x < 3 \implies x^2 < 9$ FALSA per colpa dei negativi

$\underset{x}{\underset{\shortparallel}{-1000}} < 3$ $\quad \underbrace{1000^2}_{x^2} < 9$ ↑ NO

$x > 0 \implies x^2 \geq 0$ $\boxed{\text{VERA}}$

$x > 0 \implies x^2 > 0$ VERA

$\exists\, x \in \mathbb{R}$ t.c. $x^2 \leq 0$ $\boxed{\text{VERA}}$

Basta prendere $x = 0$

$x^2 = 0 \leq 0$

$\boxed{\text{POTENZE}}$ e $\boxed{\text{RADICALI}}$

- Esponente intero positivo (positivo vuol dire > 0)

$$x^a = \underbrace{x \cdot x \cdot x \cdot \ldots \cdot x}_{a \text{ volte}}$$

$$x^3 = x \cdot x \cdot x \qquad x^4 = x \cdot x \cdot x \cdot x$$

$$x^1 = x$$

Richieste su x: NESSUNA

Proprietà $\boxed{x^a \cdot x^b = x^{a+b}}$

$$\underbrace{x \cdot \ldots \cdot x}_{\text{a volte}}^{x^a} \cdot \underbrace{x \cdot \ldots \cdot x}_{\text{b volte}}^{x^b}$$

in tutto x compare $a+b$ volte $= x^{a+b}$

$$(x^a)^b = x^{ab}$$

$$(x^3)^4 = x^3 \cdot x^3 \cdot x^3 \cdot x^3$$

$$= (x \cdot x \cdot x) \cdot (x \cdot x \cdot x) \cdot (x \cdot x \cdot x) \cdot (x \cdot x \cdot x)$$

$$= x^{12}$$

$$x^a \cdot y^a = (xy)^a$$

$$x^3 \cdot y^3 = x \cdot x \cdot x \cdot y \cdot y \cdot y$$

$$= (x \cdot y) \cdot (x \cdot y) \cdot (x \cdot y)$$

$$= (xy)^3$$

$$x^a + x^b =$$

NULLA DI FURBO!!

$$x^a - x^b =$$

$$2^{100} + 2^{100} \boxed{= 4^{100}}$$

NO!!!!!

$$= 2 \cdot 2^{100} = 2^1 \cdot 2^{100} = 2^{101}$$

- Esponente $= 0$ $\quad x^0 = 1$ (MEGLIO PER $x \neq 0$)
- Esponente INTERO negativo $\quad x^{-a} = \frac{1}{x^a}$

$$x^{-2} = \frac{1}{x^2}$$

Restrizioni su x: deve essere $\neq 0$

Continuano a valere le stesse proprietà

$$\frac{x^a}{x^b} = x^{a-b}$$

somma esponenti

$$\frac{x^a}{x^b} = x^a \cdot \frac{1}{x^b} = x^a \cdot x^{-b} = x^{a-b}$$

- <u>Esponente frazionario</u>

$$x^{\frac{a}{b}} = \sqrt[b]{x^a}$$

$$x^{\frac{1}{2}} = \sqrt{x}$$

$$x^{\frac{1}{3}} = \sqrt[3]{x}$$

$$x^{\frac{2}{3}} = \sqrt[3]{x^2}$$

$\left(x^{\frac{1}{2}}\right)^2$ deve venire $x^{\frac{1}{2}\cdot 2} = x^1 = x$

Quindi $x^{\frac{1}{2}}$ è q.c. che elevato al quadrato fa x

$$\sqrt[3]{\sqrt{x}} = \sqrt[3]{x^{\frac{1}{2}}} = \left(x^{\frac{1}{2}}\right)^{\frac{1}{3}} = x^{\frac{1}{2}\cdot\frac{1}{3}} = x^{\frac{1}{6}} = \sqrt[6]{x}$$

$$\sqrt{x}\cdot\sqrt{y} = x^{\frac{1}{2}}\cdot y^{\frac{1}{2}} = (xy)^{\frac{1}{2}} = \sqrt{xy}$$

$$x^a\cdot y^a = (xy)^a$$

$$\sqrt{x}+\sqrt{y} =$$

NULLA DI FURBO

$$\sqrt{x}-\sqrt{y} =$$

$$\sqrt{2}\cdot\sqrt[3]{2} = 2^{\frac{1}{2}}\cdot 2^{\frac{1}{3}} = 2^{\frac{1}{2}+\frac{1}{3}} = 2^{\frac{5}{6}} = \sqrt[6]{2^5} = \sqrt[6]{32}$$

$$2^a\cdot 2^b = 2^{a+b}$$

$$\sqrt[5]{2}\cdot\sqrt[3]{4} = 2^{\frac{1}{5}}\cdot 4^{\frac{1}{3}}$$

FALSA PARTENZA !!

$x^a \cdot y^b$ = NDF

$$\sqrt[5]{2} \cdot \sqrt[3]{4} = \sqrt[5]{2} \cdot \sqrt[3]{2^2} = 2^{\frac{1}{5}} \cdot 2^{\frac{2}{3}} = 2^{\frac{1}{5}+\frac{2}{3}} =$$

$2^a \cdot 2^b = 2^{a+b}$

$$= 2^{\frac{3+10}{15}} = 2^{\frac{13}{15}} = \sqrt[15]{2^{13}}$$

— o — o —

$a^4 = 2^5$ elevo tutto alla $\frac{1}{4}$

$$\left(a^{\cancel{4}}\right)^{\frac{1}{\cancel{4}}} = \left(2^5\right)^{\frac{1}{4}} \qquad a = 2^{\frac{5}{4}}$$

$4^{3a} = 2^7 \longrightarrow$ Trovare a

1° Scrivo tutto con la stessa base

$$\left(2^2\right)^{3a} = 2^7$$

$$2^{6a} = 2^7$$

Se la base è la stessa, gli esponenti devono essere uguali

$$6a = 7 \longrightarrow a = \frac{7}{6}$$

$\sqrt{a} = 2$		$\sqrt[a]{9} = 3$	
$\sqrt[a]{16} = 2$		$\sqrt[a]{16} = 4$	
$\sqrt[4]{a} = 3$		$a^{1/2} = 5$	
$a^{3/2} = 27$		$a^{-1/2} = 1/4$	
$2^{-a} = 1/8$		$8^a = 4$	
$\sqrt[a]{16} = 8$		$2^{20} - 2^{19} = 2^a$	
$\sqrt{2} \cdot \sqrt{2} = \sqrt{a}$		$\sqrt{2} \cdot \sqrt{5} = \sqrt{a}$	

$$\sqrt[a]{16} = 2 \longrightarrow \sqrt[a]{2^4} = 2 \longrightarrow 2^{\frac{4}{a}} = 2^1$$

$$\frac{4}{a} = 1 \longrightarrow a = 4$$

$$\sqrt[4]{a} = 3 \rightarrow a^{\frac{1}{4}} = 3 \rightarrow \left(a^{\frac{1}{\cancel{4}}}\right)^{\cancel{4}} = 3^4$$

$$a = 3^4 = 81$$

— o — o —

$a^{\frac{1}{2}} = 5$ elevo alla 2 : $\left(a^{\frac{1}{\cancel{2}}}\right)^{\cancel{2}} = 5^2 \rightarrow a = 25$

— o — o —

$a^{\frac{3}{2}} = 27$ $\quad a^{\frac{3}{2}} = 3^3$ elevo alla $\frac{2}{3}$:

$$\left(a^{\frac{\cancel{3}}{\cancel{2}}}\right)^{\frac{\cancel{2}}{\cancel{3}}} = \left(3^3\right)^{\frac{2}{3}}$$

$$a = \left(3^3\right)^{\frac{2}{3}} = 3^{\cancel{3}\cdot\frac{2}{\cancel{3}}} = 3^2 = 9$$

— o — o —

$a^{-\frac{1}{2}} = \frac{1}{4}$ $\quad a^{-\frac{1}{2}} = 2^{-2}$ $\quad$ elevo alla (-2) :

$$\left(a^{-\frac{1}{\cancel{2}}}\right)^{-\cancel{2}} = \left(2^{-2}\right)^{-2}$$

$$a = 2^{(-2)\cdot(-2)} = 2^{4} = 16$$

— o — o —

$2^{-a} = \frac{1}{8}$; $2^{-a} = \frac{1}{2^3}$; $2^{-a} = 2^{-3}$

stessa base : $-a = -3 \Rightarrow a = 3$

— o — o —

$8^{a} = 4$; $\left(2^{3}\right)^{a} = 2^{2}$; $2^{3a} = 2^{2}$ stessa base

$3a = 2 \rightarrow a = 2/3$

$\sqrt[a]{16} = 8$; $\sqrt[a]{2^4} = 2^3$; $2^{\frac{4}{a}} = 2^3$ stessa base

$$\frac{4}{a} = 3 \longrightarrow a = \frac{4}{3}$$

— o — o —

$2^{20} - 2^{19} =$ USO CHE $2^{20} = 2^1 \cdot 2^{19}$

$$2 \cdot \boxed{2^{19}} - \boxed{2^{19}} = 2^{19}$$

CANE CANE

Risultato $2^{20} - 2^{19} = 2^{19}$

— o — o —

$\sqrt{2} \cdot \sqrt{2} = \sqrt{a}$ $2^{\frac{1}{2}} \cdot 2^{\frac{1}{2}} = a^{\frac{1}{2}}$

$$2^{\frac{1}{2}+\frac{1}{2}} = a^{\frac{1}{2}} \rightarrow (2)^2 = \left(a^{\frac{1}{\cancel{2}}}\right)^{\cancel{2}} \rightarrow a = 4.$$