Soluzioni del 26/11/21

a) $\Delta \geqslant 0 \rightarrow (-4)^2 - 4 \cdot 3 \cdot c \geqslant 0 \rightarrow 16 - 12 \cdot c \geqslant 0$

$\rightarrow \boxed{c \leq 4/3}$

b) $\Delta > 0 \rightarrow \dots \rightarrow \boxed{c < 4/3}$

c) $\Delta = 0 \rightarrow \dots \rightarrow \boxed{c = 4/3}$

d) $\Delta < 0 \rightarrow \dots \rightarrow \boxed{c > 4/3}$

e) $x_1 + x_2 = -\frac{b}{a} \Rightarrow 2 = -\frac{-4}{3} \Rightarrow 2 = \frac{4}{3}$ $\boxed{\text{IMPOSSIBILE!}}$

f) $x_1 \cdot x_2 = 6 \Rightarrow \frac{c}{a} = 6 \Rightarrow \frac{c}{3} = 6 \Rightarrow c = 18$

NON ACCETTABILE.

g) $x_1 \cdot x_2 = -1 \Rightarrow \frac{c}{a} = -1 \Rightarrow \frac{c}{3} = -1 \Rightarrow \boxed{c = -3}$ ACCETT.

h) $x_1^2 + x_2^2 = (x_1 + x_2)^2 - 2 x_1 x_2 = \left(-\frac{-4}{3}\right)^2 - 2 \cdot \frac{c}{a}$;

QUINDI $\frac{16}{9} - 2 \cdot \frac{c}{3} = \frac{10}{9} \Rightarrow \frac{16 - 6c}{9} = \frac{10}{9} \Rightarrow \boxed{c = 1}$ Acc.

i) $\frac{1}{x_1^2} + \frac{1}{x_2^2} = \frac{x_2^2 + x_1^2}{x_1^2 \cdot x_2^2} = \frac{(x_1 + x_2)^2 - 2 x_1 \cdot x_2}{(x_1 \cdot x_2)^2} \Rightarrow$

$\Rightarrow \frac{\left(\frac{4}{3}\right)^2 - 2 \cdot \frac{c}{3}}{\left(\frac{c}{3}\right)^2} = \frac{17}{50} \Rightarrow \frac{16}{9} - \frac{2}{3} \cdot c = \frac{17}{50} \cdot \frac{c^2}{9}$

$\Rightarrow c_1 = \frac{40}{17}$ NON Acc. $\boxed{c_2 = -20}$ Acc.

l) $(x_1 + x_2)^2 = \frac{16}{9} \Rightarrow \left(-\frac{-4}{3}\right)^2 = \frac{16}{9}$ VERA $\forall c \leq \frac{4}{3}$.

QUINDI $\boxed{c \leq 4/3}$

m) $\frac{1}{x_1} + \frac{1}{x_2} = \frac{x_2 + x_1}{x_1 \cdot x_2} = \frac{-\frac{-4}{3}}{c/3} = \frac{4}{3} \cdot \frac{3}{c} = \frac{4}{c} \Rightarrow$

$\frac{4}{c} = -\frac{1}{8} \Rightarrow \boxed{c = -32}$ Acc.

m) $x_1 > 0; x_2 > 0.$

LA SOMMA $(x_1 + x_2)$ DEVE ESSERE > 0.

IL PRODOTTO $(x_1 \cdot x_2)$ " " > 0.

$$\begin{cases} -\frac{-4}{3} > 0 \\ \frac{c}{3} > 0 \\ c \leq 4/3 \end{cases} \Rightarrow \begin{cases} \frac{4}{3} > 0 \\ c > 0 \\ c \leq 4/3 \end{cases} \Rightarrow \boxed{0 < c \leq \frac{4}{3}}$$

o) $x_1 < 0 \; ; \; x_2 < 0$

LA SOMMA $(x_1 + x_2)$ DEVE ESSERE < 0.

IL PRODOTTO $(x_1 \cdot x_2)$ " " > 0

$$\begin{cases} -\frac{-4}{3} < 0 \\ \frac{c}{3} > 0 \\ c \leq 4/3 \end{cases} \Rightarrow \nexists \text{ SOLUZIONI}$$

p) SOLUZIONI DISCORDI $\rightarrow x_1 \cdot x_2 < 0$

$$\begin{cases} \frac{c}{3} < 0 \\ c \leq 4/3 \end{cases} \Rightarrow \begin{cases} c < 0 \\ c \leq 4/3 \end{cases} \Rightarrow \boxed{c < 0}$$

q) $$\begin{cases} 3 \cdot x_1 = -7 \cdot x_2 \\ x_1 + x_2 = \frac{4}{3} \end{cases} \Rightarrow \dots \Rightarrow \begin{cases} x_1 = 7/3 \\ x_2 = -1 \end{cases}$$

$$x_1 \cdot x_2 = \frac{c}{a} \Rightarrow \frac{7}{3} \cdot (-1) = \frac{c}{3} \Rightarrow \boxed{c = -7} \text{ Acc.}$$

r) $$x_1^3 + x_2^3 = (x_1 + x_2)^3 - 3x_1^2 \cdot x_2 - 3 \cdot x_1 \cdot x_2^2 =$$

$$= (x_1 + x_2)^3 - 3x_1 \cdot x_2 \cdot (x_1 + x_2) =$$

$$= \left(\frac{4}{3}\right)^3 - 3 \cdot \frac{c}{3} \cdot \left(\frac{4}{3}\right).$$

$$\frac{64}{27} - \frac{4}{3}c = \frac{28}{27} \Rightarrow \frac{64-36c}{27} = \frac{28}{27} \Rightarrow$$

$\boxed{c=1}$ Acc.

s) $$\frac{1}{x_1^3} + \frac{1}{x_2^3} = \frac{x_2^3 + x_1^3}{x_1^3 \cdot x_2^3} = \frac{(x_1+x_2)^3 - 3 \cdot x_1 \cdot x_2 \cdot (x_1+x_2)}{(x_1 \cdot x_2)^3}$$

$$\Rightarrow \frac{\left(\frac{4}{3}\right)^3 - 3 \cdot \frac{c}{3} \cdot \left(\frac{4}{3}\right)}{\left(\frac{c}{3}\right)^3} = -\frac{316}{343} \Rightarrow \frac{316}{9'261}c^3 - \frac{4}{3}c + \frac{64}{27} = 0$$

$$\Rightarrow 316c^3 - 12'348c + 21'952 = 0$$

$$\Rightarrow 79c^3 - 3'087c + 5'488 = 0.$$

$c = -7$ RISOLVE.

	79	0	−3'087	5'488
−7		−553	3'871	−5'488
	79	−553	784	//

$$79c^2 - 553c + 784 = 0$$

$$\Delta = 58'065 = 3 \cdot 5 \cdot 7^2 \cdot 79 = 7^2 \cdot 1185.$$

$$c_{1,2} = \frac{553 \pm 7 \cdot \sqrt{1'185}}{2 \cdot 79} = \begin{cases} \dfrac{553 + 7\sqrt{1185}}{158} \approx 5,03 \\[2ex] \dfrac{553 - 7\sqrt{1185}}{158} \approx 1,97 \end{cases}$$

L'UNICA SOLUZIONE ACCETTABILE È $\boxed{c=-7}$.

t) $$\underbrace{x_1 + x_2}_{\frac{4}{3}} = -2 \cdot \underbrace{x_1 \cdot x_2}_{\frac{c}{3}} \Rightarrow \frac{4}{3} = -2 \cdot \frac{c}{3} \Rightarrow \boxed{c=-2}$$

Acc.

u) $\begin{cases} x_1 - x_2 = \frac{38}{3} \\ x_1 + x_2 = \frac{4}{3} \end{cases} \Rightarrow \begin{cases} x_1 = 7 \\ x_2 = -\frac{17}{3} \end{cases}$

$x_1 \cdot x_2 = \frac{c}{3} \Rightarrow 7 \cdot \left(-\frac{17}{3}\right) = \frac{c}{3} \Rightarrow \boxed{c = -119}$

Acc.

v) $3 \cdot (-10)^2 - 4 \cdot (-10) + c = 0 \Rightarrow \boxed{c = -340}$

Acc.

2) L'EQUAZIONE DOVREBBE ESSERE PURA (IN ALTERNATIVA: LA SOMMA ~~dell~~ delle SOLUZIONI DEVE ESSERE $= 0$).

$\boxed{\nexists\ c \text{ CHE SODDISFANO LA RICHIESTA.}}$