ESERCIZI LEZ. 03/10

GLI INSIEMI NUMERICI

Calcola il M.C.D. e il m.c.m. fra i seguenti gruppi di numeri.

304 30, 33, 35 [M.C.D. = 1; m.c.m. = 2310]

305 110, 120, 130 [M.C.D. = 10; m.c.m. = 17 160]

306 110, 121, 55 [M.C.D. = 11; m.c.m. = 1210]

307 44, 24, 80, 100 [M.C.D. = 4; m.c.m. = 13 200]

308 48, 60, 72, 132 [M.C.D. = 12; m.c.m. = 7920]

309 396, 1254, 297 [M.C.D. = 33; m.c.m. = 22 572]

310 $15 \cdot 27$, $25 \cdot 18$, $24 \cdot 16$ [M.C.D. = 3; m.c.m. = 259 200]

311 $36 \cdot 15$, $18 \cdot 20$, $42 \cdot 45$ [M.C.D. = 90; m.c.m. = 7560]

312 110, 33, 1221 [M.C.D. = 11; m.c.m. = 12 210]

313 6, 9, 3456 [M.C.D. = 3; m.c.m = 3456]

Calcola applicando le proprietà delle potenze.

441 $(-2)^{11} : (-2)^7$ [16]

442 $(-10)^9 : (-10)^9$ [1]

443 $[(-2)^3]^2$ [64]

444 $(-3)^{12} : (-3)^9$ [−27]

445 $(-2)^2 \cdot (-2)^3$ [−32]

446 $(-10)^8 : (-10)^7$

447 $[(-1)^3]^3$

448 $(-3)^2 \cdot (-3)^2$

449 $(-5)^5 \cdot (-5)^4 : (-5)^7$

450 $(-7)^{12} : [(-7)^5]^2$

473 $(-2)^{10} : (-2)^8 \cdot (+2)^2$ [16]

474 $(-3)^{11} : (+3)^9 \cdot (+3)^2$ [−81]

475 $(-81)^4 \cdot (+3)^3 : (-3)^{16}$ [27]

476 $(-4)^4 \cdot (-2)^{10} : (-16)^3$ [−64]

477 $(-125)^7 : (-25)^{10} \cdot (-5)^2$ [−125]

Calcola il valore delle seguenti espressioni applicando, ovunque possibile, le proprietà delle potenze.

519 Video $\{(-5^3)^4 \cdot (-5^4)^5 : [(-5)^{10} : (-5)^3]^4\}^8 : [(-5^4)^4]^2$ [1]

520 $[(-2)^6 \cdot (-2)^4]^2 : [(-2)^{30} : (-2)^{27}]^5$ [−32]

521 $(-12)^2 : (-4) + (-12)^{10} : [(-12)^2 \cdot (-12)^3]^2$ [−35]

522 $[(-4)^{11} \cdot (-4)^8] : (-4)^{17} + (-4)^{13} : [(-4)^6]^2$ [12]

523 $\{(-21)^3 : (-7)^2 + [(-21)^3]^2 : (-21)^5\} : (-2)^2$ [−3]

524 $[(-2)^2 \cdot (-2)^5]^3 : (-2)^{17} + (-12) : (-2)^2$ [13]

591 $[5 \cdot (8 - 2^8 : 2^6) - (13 - 3^5 : 3^3)]^3 : (6^7 : 6^6 - 2^{10} : 2^8)^9$ [8]

592 $\{[5^6 : 5^4 - 20]^{10}\}^3 : 5^{28} - 20^7 : [(19 + 19^0)^2]^3$ [5]

593 $\{[(2^3 \cdot 2^{11})^2 : (2^5)^5 - 3]^3 \cdot 5^5\} : 5^6 - (4^8 \cdot 4^{20}) : (4^{13})^2$ [9]

594 $\{[(4^2)^3 : (2^5)^2] \cdot 8^2\} : 2^5 + (3^4 \cdot 2^4)^2 : 6^7 + [(12^2 - 11^2)^3 \cdot 23^4] : 23^7$ [15]

595 $[(-2)^8 : (-2)^3]^2 : (-2)^7 + [(-2)^8 \cdot (-2)^3]^2 : [(-2)^3]^6$ [8]

596 $[(8 \cdot 45)^4 : (6 \cdot 25)^2] : (16 \cdot 27)^2$ [4]

597 $[(40 \cdot 49)^2 \cdot 35 \cdot 18] : (280 \cdot 21)^2$ [70]

Calcola il valore delle seguenti espressioni applicando, ovunque possibile, le proprietà delle potenze.

146 $\left\{\left[\left(\frac{2}{3}\right)^5 \cdot \left(\frac{2}{3}\right)^4\right]^2 : \left[\left(\frac{2}{3}\right)^3\right]^5 + \left(\frac{2}{3}\right)^2 + \frac{2}{3}\right\} : \frac{19}{9}$ $\left[\frac{2}{3}\right]$

147 $\left\{\left(\frac{5}{4}\right)^{11} : \left[\left(\frac{5}{4}\right)^5\right]^2 + \left(\frac{3}{2}\right)^7 : \left[\left(\frac{3}{2}\right)^3\right]^2 - 2\right\} \cdot \left(\frac{4}{11} - \frac{3}{22} + \frac{1}{2}\right)$ $\left[\frac{6}{11}\right]$

148 $\left[\left(\frac{5}{4}\right)^9 \cdot \left(\frac{5}{4}\right)^4\right]^2 : \left[\left(\frac{5}{4}\right)^5 \cdot \left(\frac{5}{4}\right)^3\right]^3 - \frac{9}{16}$ [1]

149 $\frac{1}{2} + \left[\left(\frac{2}{5}\right)^4\right]^3 : \left(\frac{2}{5}\right)^{11} + \left[\left(\frac{9}{10}\right)^2\right]^5 : \left[\left(\frac{9}{10}\right)^3\right]^3$ $\left[\frac{9}{5}\right]$

Semplifica, applicando le proprietà delle potenze e lasciando il risultato sotto forma di potenza.

413 $\left(\frac{1}{3}\right)^{-2}\cdot\left(\frac{1}{3}\right)^{7}$; $\left(-\frac{2}{3}\right)^{4}:\left(-\frac{2}{3}\right)^{8}$; $\left[\left(-\frac{5}{4}\right)^{-1}\right]^{3}$ $\left[\left(\frac{1}{3}\right)^{5};\left(-\frac{2}{3}\right)^{-4};\left(-\frac{5}{4}\right)^{-3}\right]$

414 $\left(\frac{3}{4}\right)^{5}\cdot\left(\frac{3}{4}\right)^{-9}$; $\left(-\frac{5}{3}\right)^{7}:\left(-\frac{5}{3}\right)^{-11}$; $\left[\left(-\frac{9}{4}\right)^{-5}\right]^{-4}$ $\left[\left(\frac{3}{4}\right)^{-4};\left(-\frac{5}{3}\right)^{18};\left(-\frac{3}{2}\right)^{40}\right]$

415 $\left(\frac{7}{5}\right)^{4}\cdot\left(\frac{7}{5}\right)^{-8}\cdot\left(\frac{7}{5}\right)^{3}$; $\left(-\frac{1}{13}\right)^{8}:\left(-\frac{1}{13}\right)^{-11}:\left(-\frac{1}{13}\right)^{-8}$; $\left\{\left[\left(\frac{5}{4}\right)^{5}\right]^{-5}\right\}^{2}$ $\left[\left(\frac{7}{5}\right)^{-1};\left(-\frac{1}{13}\right)^{27};\left(\frac{5}{4}\right)^{-50}\right]$

416 $\left(-\frac{1}{3}\right)^{-1}\cdot\left(-\frac{1}{3}\right)^{-5}\cdot\left(-\frac{1}{3}\right)^{-2}$; $\left(-\frac{1}{3}\right)^{10}:\left(-\frac{1}{3}\right)^{5}:\left(-\frac{1}{3}\right)^{8}$; $\left\{\left[\left(\frac{1}{10}\right)^{-3}\right]^{3}\right\}^{-2}$ $\left[\left(-\frac{1}{3}\right)^{-8};\left(-\frac{1}{3}\right)^{-3};\left(\frac{1}{10}\right)^{18}\right]$

417 $\left(\frac{1}{2}\right)^{13}\cdot\left(\frac{1}{2}\right)^{-3}:\left(\frac{1}{2}\right)^{-15}$; $\left(\frac{1}{2}\right)^{12}\cdot\left[\left(\frac{1}{2}\right)^{-3}:\left(\frac{1}{2}\right)^{-15}\right]$ $\left[\left(\frac{1}{2}\right)^{25};\left(\frac{1}{2}\right)^{24}\right]$

418 $\left[\left(\frac{1}{2}\right)^{-15}\cdot\left(\frac{1}{2}\right)^{5}\right]:\left[\left(-\frac{1}{2}\right)^{-3}\right]^{4}$; $\left[\left(-\frac{8}{7}\right)^{-18}\cdot\left(-\frac{8}{7}\right)^{14}\right]:\left[\left(\frac{8}{7}\right)^{-16}\right]^{2}$ $\left[\left(\frac{1}{2}\right)^{2};\left(\frac{8}{7}\right)^{28}\right]$

Semplifica le seguenti espressioni contenenti radicali numerici. Scrivi il risultato in forma razionalizzata.

896 $\frac{3}{\sqrt{2}+\sqrt{3}}-\sqrt{75}+\sqrt{50}+\sqrt{12}$ $[2\sqrt{2}]$

897 $\frac{1}{1+\sqrt{3}}+\frac{1}{1-\sqrt{3}}+\sqrt{12}$ $[2\sqrt{3}-1]$

898 $\frac{(\sqrt{3}+\sqrt{2})^{2}-(\sqrt{3}+\sqrt{2})(\sqrt{3}-\sqrt{2})}{2+\sqrt{6}}$ $[2]$

899 $\sqrt{\frac{9}{2}}+\sqrt{\frac{25}{8}}+\sqrt[3]{3000}-8\sqrt[3]{3}-\sqrt[3]{24}+\sqrt{\frac{1}{8}}$ $[3\sqrt{2}]$

900 $2\sqrt{20}-\frac{20}{\sqrt{5}}+\sqrt{500}+\left(\frac{5}{\sqrt{40}}-\frac{\sqrt{90}}{4}\right):(-\sqrt{2})+\sqrt{\frac{5}{4}}$ $[11\sqrt{5}]$

901 $\frac{16}{1+\sqrt{20}-3\sqrt{5}}+(\sqrt{5}-1)^{2}(\sqrt{5}+1)$ $[-8]$

902 $(\sqrt{2}+\sqrt{3})^{2}+\frac{5}{\sqrt{6}-1}+(\sqrt{2}-\sqrt{3})(\sqrt{2}+\sqrt{3})$ $[5+3\sqrt{6}]$

903 $(\sqrt{2}+\sqrt{5})^{2}+\sqrt{40}+\sqrt[4]{100}+\sqrt{2}\cdot\sqrt{5}$ $[7+6\sqrt{10}]$

904 $\frac{\sqrt{2}-1}{\sqrt{2}+1}+\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}+\sqrt{8}+\sqrt[4]{100}\cdot\sqrt[6]{27}$ $[14-\sqrt{30}]$

905 $\sqrt{3-\sqrt{3}}\cdot\sqrt{3+\sqrt{3}}+\sqrt{24}+\sqrt[3]{6\sqrt{6}}$ $[4\sqrt{6}]$

906 $\frac{8-\sqrt{300}-\sqrt{32}+\sqrt{150}}{\sqrt{2}-1}:\frac{1}{4\sqrt{2}+5\sqrt{6}}$ $[-118]$

907 $\frac{2(1+\sqrt{2})-\sqrt{5}(1+\sqrt{2})}{\sqrt{(-2)^{2}}+\sqrt{(1-\sqrt{2})^{2}}}+\frac{10}{\sqrt{20}}$ $[2]$

908 $\left(\frac{\sqrt{6}-\sqrt{2}+\sqrt{15}-\sqrt{5}}{\sqrt{6}+\sqrt{2}+\sqrt{15}+\sqrt{5}}-2+\sqrt{75}\right)^{2}$ $[48]$

909 $\frac{\sqrt[4]{2}\cdot\sqrt[3]{2}}{\sqrt[12]{2^{6}}}+\sqrt[24]{4}+\sqrt{\sqrt[3]{2}}$ $[3\sqrt[12]{2}]$

IL CALCOLO LETTERALE

Esegui le seguenti moltiplicazioni, utilizzando se possibile il prodotto notevole della somma di due monomi per la loro differenza. In caso contrario, procedi moltiplicando normalmente.

249 $(3a-4b)(3a+4b)$ $(2x-y)(2x+y)$ $[9a^{2}-16b^{2};\ 4x^{2}-y^{2}]$

250 $(a-2)(a+2)$ $(3x-2)(3x+2)$ $[a^{2}-4;\ 9x^{2}-4]$

251 $(a^{3}-1)(a^{3}+1)$ $(x^{4}+x^{2})(x^{2}-x^{4})$ $[a^{6}-1;\ x^{4}-x^{8}]$

252 $(xy+10)(10-xy)$ $(t^{2}+9)(t^{2}-9)$ $[100-x^{2}y^{2};\ t^{4}-81]$

Calcola i seguenti quadrati di binomi.

307 $(a-3b)^{2}$ $(2x+5y)^{2}$ $[a^{2}-6ab+9b^{2};\ 4x^{2}+20xy+25y^{2}]$

308 $(2x-1)^{2}$ $(y-3)^{2}$ $[4x^{2}-4x+1;\ y^{2}-6y+9]$

309 $(x-2y^{2})^{2}$ $(ab+4)^{2}$ $[x^{2}-4xy^{2}+4y^{4};\ a^{2}b^{2}+8ab+16]$

310 $(5-x)^{2}$ $(x^{2}+1)^{2}$ $[25-10x+x^{2};\ x^{4}+2x^{2}+1]$

311 $(-xy+1)^{2}$ $(a^{2}-b^{2})^{2}$ $[x^{2}y^{2}-2xy+1;\ a^{4}-2a^{2}b^{2}+b^{4}]$

312 $(-5a-b)^{2}$ $(-x+3)^{2}$ $[25a^{2}+10ab+b^{2};\ x^{2}-6x+9]$

Calcola rapidamente, utilizzando i prodotti notevoli.

348 $(x^2-x-1)(x^2-x+1)$ $(x^2-x+1)(x^2+x-1)$ $[x^4-2x^3+x^2-1;\ x^4-x^2+2x-1]$

349 $(a+b-3c)(a+b+3c)$ $(a+b-3c)(a-b+3c)$ $[a^2+2ab+b^2-9c^2;\ a^2-b^2+6bc-9c^2]$

350 $(x+xy+y)(x-xy+y)$ $(x+xy+y)(x+xy-y)$ $[x^2+2xy+y^2-x^2y^2;\ x^2+2x^2y+x^2y^2-y^2]$

Semplifica le seguenti espressioni utilizzando, ovunque possibile, i prodotti notevoli.

359 $(a+2b)^2-(a-2b)^2+(4ab+1)^2-(4ab+1)(4ab-1)$ $[16ab+2]$

360 $(x+1)^2-(x+2)^2+(x-1)(x+1)(x^2-1)+(x^2-1)(-x^2+1)$ $[-2x-3]$

361 $(a-3b)(-a-3b)+(a-3b)(a+3b)+(a-3b)(3b-a)+a^2+9b^2$ $[6ab]$

362 $(x+2y)(2y+x)+(-x-2y)^2+(2x-y)(-2x+y)+2x(x-6y)$ $[7y^2]$

363 $\left(\frac{1}{2}x-1\right)^2+\left(\frac{1}{2}x-1\right)\left(\frac{1}{2}x+1\right)+\left(\frac{1}{2}x+1\right)^2+\left(-\frac{1}{2}x-1\right)\left(-\frac{1}{2}x+1\right)$ $[x^2]$

Calcola i seguenti cubi di binomi.

404 $(2x-1)^3$ $(xy-2)^3$ $[8x^3-12x^2+6x-1;\ x^3y^3-6x^2y^2+12xy-8]$

405 $(x+2)^3$ $(2-3x)^3$ $[x^3+6x^2+12x+8;\ 8-36x+54x^2-27x^3]$

406 $(a^3-2)^3$ $(2a^2+b^2)^3$ $[a^9-6a^6+12a^3-8;\ 8a^6+12a^4b^2+6a^2b^4+b^6]$

Semplifica le seguenti espressioni utilizzando, ovunque possibile, i prodotti notevoli.

453 $(2a+1)^3-2a(2a+1)^2-(2a)^2-1$ $[4a]$

454 $[(x+1)^2-4x]^2-(x^2+1)^2-(x^2-2x)^2$ $[-x^4-4x]$

455 $(a-1)^2(a+2)+(1-a)(a+1)(a-2)$ $[2a^2-2a]$

456 $[(x+1)^2-2x]^2-(x+1)^2(x-1)^2$ $[4x^2]$

457 $\left(x-\frac{1}{2}y\right)^2+\left(x+\frac{1}{2}y\right)^2+2\left(x-\frac{1}{2}y\right)\left(x+\frac{1}{2}y\right)$ $[4x^2]$

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599 $2x(x-1)-(x+2)(x-4)-2(-x^2+x-1)+x(x+2)$ $[4x^2+10]$

600 $\left(\frac{1}{2}x+\frac{1}{4}y\right)(4x-8y)-(x-2y)(x+y)+(-8x^5y^3):(-4x^4y^2)$ $[x^2]$

601 $(m-1)^2(m+1)^2-(m^2-m-1)(m^2+m-1)$ $[m^2]$

602 $\left(\frac{1}{2}a-1\right)^2+(a-3)\left(1-\frac{5}{2}a\right)+\left(\frac{3}{2}a-1\right)\left(\frac{3}{2}a+1\right)-3(a-1)$ $\left[\frac{9}{2}a\right]$

603 $\left(2x-\frac{1}{2}y\right)^3+\left(2x+\frac{1}{2}y\right)^3-x(4x-3y)(4x+3y)$ $[12xy^2]$

LE EQUAZIONI DI 1°

176 $20(5-x)=10(x+1)+80$ $\left[\frac{1}{3}\right]$

177 $0{,}3(0{,}2x+0{,}5)=0{,}2(0{,}05x-0{,}5)$ $[-5]$

178 $\frac{x-2}{4}-\frac{x+2}{2}=-\frac{1}{4}x-\frac{3}{2}$ [Indeterminata]

179 $(2x-1)^2=3x^2+(x+1)^2$ $[0]$

180 $\frac{x-1}{5}-\frac{x+1}{2}=\frac{17+x}{15}$ $[-5]$

181 $2(x-1)-3(3-x)=5(x-1)-6$ [Indeterminata]

182 $\frac{x}{20}-\frac{x-4}{10}=\frac{3+x}{15}$ $\left[\frac{12}{7}\right]$

183 $[(x-1)^2-x^2]^2=(2x-1)(2x+1)-10$ $[3]$

184 $(3x+1)(6x-1)-(3x+2)^2-(3x-2)^2=2x$ $[9]$

185 $3x+(3-x)^2=(x-1)^2-2$ $[10]$

186 $[(x-1)^2-(x-2)^2]^2=4(x-1)^2$ $\left[\frac{5}{4}\right]$

187 $\frac{2x-3}{4}+6+\frac{x}{2}=\frac{3(x-3)}{4}-2$ $[-38]$

188 $[(x+1)^2-(x-1)^2]^2=(4x-1)(4x+1)$ [Impossibile]

189 $\frac{2}{3}\left[2-\left(\frac{x}{3}+6\right)-2(x-1)\right]=\frac{5}{6}x-1$ $\left[-\frac{6}{43}\right]$

190 $\frac{1}{2}\left[\frac{1}{2}\left(\frac{1}{2}x-1\right)-1\right]-1=2^{-3}$ $[15]$

LE DISEQUAZIONI DI 1^

Risolvi le seguenti disequazioni di primo grado a coefficienti interi.

90 $2(x-1)-x>3-x$ $\left[x>\frac{5}{2}\right]$

91 $x-(x-2)+2(x+3)>1-(2-3x)$ $[x<9]$

92 $3(x-1)-2(x+2)<-3(x-1)$ $\left[x<\frac{5}{2}\right]$

93 $1-2(x+3)-(3-x)\leq 3(2-x)$ $[x\leq 7]$

94 $3(x-1)-(x+7)<2(1-x)+1$ $\left[x<\frac{13}{4}\right]$

103 $11-(2^{12}:2^9)x\geq -3(1-2x)$ $[x\leq 1]$

104 $-2[(3^5\cdot 3^7):(3^2)^5-x]>6-6x$ $[x>3]$

105 $5-[(10^2)^7:10^{13}]x\geq 3(2-4x)$ $\left[x\geq\frac{1}{2}\right]$

106 $-2-[2x-(10^{13}x-10^{12}):10^{11}]\geq(10^{14}:10^{12})x$ $[x\leq -6]$

107 $22-(2^{15}x-2^{13}):(2^4)^3\geq 3x-2(3-2x)$ $[x\leq 2]$

Risolvi i seguenti sistemi costituiti da due disequazioni.

231 $\begin{cases}2(x-1)>1\\-x>3(x+1)\end{cases}$ [Impossibile]

232 $\begin{cases}\frac{1}{2}(x-1)>x\\2(2-x)>3x\end{cases}$ $[x<-1]$

233 $\begin{cases}x+1>3(x-1)\\-x<2(x+1)\end{cases}$ $\left[-\frac{2}{3}<x<2\right]$

234 Video $\begin{cases}\frac{2}{3}x-\frac{1}{2}<\frac{1}{2}x+\frac{2}{3}\\6x+4\geq 4x-6\end{cases}$ $[-5\leq x<7]$

235 $\begin{cases}-\frac{1}{2}x>\frac{x-1}{3}\\2(x-1)>3(x+2)\end{cases}$ $[x<-8]$

236 $\begin{cases}\frac{1}{2}(x-1)+x\geq\frac{2-x}{3}\\2(1-x)<3(1-x)\end{cases}$ $\left[\frac{7}{11}\leq x<1\right]$

237 $\begin{cases}\frac{x}{10}-\frac{x+1}{15}>\frac{1-x}{20}\\\frac{x}{4}\geq\frac{x-1}{6}-\frac{1}{3}x\end{cases}$ $\left[x>\frac{7}{5}\right]$

238 $\begin{cases}\frac{1}{10}(x-20)\geq\frac{1}{5}x-2\\2(x-4)\leq 4(2-x)+1\end{cases}$ $[x\leq 0]$

LE SCOMPOSIZIONI

Scomponi i seguenti polinomi.

401 $a^2x^3-a^6x$ $[a^2x(x+a^2)(x-a^2)]$

402 $2a^3-12a^2+18a$ $[2a(a-3)^2]$

403 Ragiona sul video $m^5+2m^4-m^3-2m^2$ $[m^2(m-1)(m+1)(m+2)]$

404 $x^3y+x^2y^2-x-y$ $[(x+y)(x^2y-1)]$

405 x^8-16x^4 $[x^4(x-2)(x+2)(x^2+4)]$

406 $2x^2-2x-12$ $[2(x+2)(x-3)]$

407 $3x^6+6x^4+3x^2$ $[3x^2(x^2+1)^2]$

408 $a^5b-a^9b^3$ $[a^5b(a^2b+1)(1-a^2b)]$

409 $a^2b+a^2c-abc-ac^2$ $[a(a-c)(b+c)]$

410 $2m^4-32$ $[2(m-2)(m+2)(m^2+4)]$

411 $x^2-mx-2m^2$ $[(x+m)(x-2m)]$

412 $3a^5b^2+12ab^8-12a^3b^5$ $[3ab^2(a^2-2b^3)^2]$

413 $2xy+2xw-2wy-2w^2$ $[2(x-w)(y+w)]$

414 $a^5b^2-ab^6$ $[ab^2(a^2+b^2)(a+b)(a-b)]$

415 $3m^3+3m^2-6m$ $[3m(m-1)(m+2)]$

416 $2x-xy+2y-y^2$ $[(2-y)(x+y)]$

417 x^8-y^8 $[(x-y)(x+y)(x^2+y^2)(x^4+y^4)]$

418 $3x^4-27x^2$ $[3x^2(x+3)(x-3)]$

423 $27a^6-a^3$ $[a^3(3a-1)(9a^2+3a+1)]$

424 a^3+2a^2-a-2 $[(a+1)(a-1)(a+2)]$

425 $2x^3-18x^2+54x-54$ $[2(x-3)^3]$

426 x^2-y^2+6y-9 $[(x+y-3)(x-y+3)]$

427 $2m^6-16m^3$ $[2m^3(m-2)(m^2+2m+4)]$

428 $\frac{1}{2}a^3-8a$ $\left[\frac{1}{2}a(a+4)(a-4)\right]$

429 $3x^2-\frac{1}{3}y^2$ $\left[\frac{1}{3}(3x+y)(3x-y)\right]$

430 $\frac{1}{10}x^6-40x^2$ $\left[10x^2\left(\frac{1}{10}x^2-2\right)\left(\frac{1}{10}x^2+2\right)\right]$

431 $\frac{3}{4}x^3+3x-3x^2$ $\left[\frac{3}{4}x(x-2)^2\right]$

432 x^4-10x^2+9 $[(x-1)(x+1)(x-3)(x+3)]$

433 x^3+5x^2+7x+3 $[(x+1)^2(x+3)]$

434 $a^2-b^2+ax+bx$ $[(a+b)(x+a-b)]$

435 x^4-x^2+ax+a $[(x+1)(x^3-x^2+a)]$

436 $4x^2-y^2-2x+y$ $[(2x-y)(2x+y-1)]$

437 $2(a^2+2a+1)+a^2x-x$ $[(a+1)(ax-x+2a+2)]$

438 $x^2y-4y-x-2$ $[(x+2)(xy-2y-1)]$

439 x^4-1+x^3y-xy $[(x-1)(x+1)(x^2+xy+1)]$

P3

Scomponi i seguenti polinomi.

561 $16x^4 - 10000y^4$ $[16(x-5y)(x+5y)(x^2+25y^2)]$

562 $m - m^4$ $[m(1-m)(1+m+m^2)]$

563 $16a^5 - a$ $[a(2a-1)(2a+1)(4a^2+1)]$

564 $x^4y^7 + x^2y^3 - 2x^3y^5$ $[x^2y^3(xy^2-1)^2]$

565 $t^4 + 5t^3 + 6t^2$ $[t^2(t+2)(t+3)]$

566 $2x^2 - 2 - (x-1)^2$ $[(x-1)(x+3)]$

567 $2x^2 - 3x - 2$ $[(2x+1)(x-2)]$

568 $a^6 - a^5 - a^3 + a^2$ $[a^2(a-1)^2(a^2+a+1)]$

569 $4x^2 - 12x - 40$ $[4(x-5)(x+2)]$

570 $(a^2+1)^2 - 4a^2$ $[(a-1)^2(a+1)^2]$

571 $x^3 + 5x^2 + 3x - 9$ $[(x-1)(x+3)^2]$

572 $a^7 - a$ $[a(a-1)(a+1)(a^2+a+1)(a^2-a+1)]$

573 $12x^2 - 60x + 75$ $[3(2x-5)^2]$

574 $4m^4 + 4m^2 + 1 - 9n^2$ $[(2m^2+1-3n)(2m^2+1+3n)]$

598 $x^2 + x + a - a^2$ $[(x+a)(x-a+1)]$

599 $8x^4 + 12x^3 + 6x^2 + x$ $[x(2x+1)^3]$

600 $t^4 - 8t^2 + 16$ $[(t-2)^2(t+2)^2]$

601 $2x^4 + 2x$ $[2x(x+1)(x^2-x+1)]$

602 $x^3 + x^2y + xy^2 + y^3$ $[(x+y)(x^2+y^2)]$

603 $a^2 + ab - 2b^2$ $[(a-b)(a+2b)]$

604 $a^3 + 3a^2 - 4a - 12$ $[(a-2)(a+2)(a+3)]$

605 $(2t+1)^2 - (4t-5)^2$ $[4(3-t)(3t-2)]$

606 $2m^2 + 12m + 16$ $[2(m+2)(m+4)]$

607 $ax^2 - ay^2 + bx^2 - by^2$ $[(a+b)(x+y)(x-y)]$

608 $9a^2 - 12a + 4$ $[(3a-2)^2]$

609 $x^3 + 5x^2 + x + 5$ $[(x+5)(x^2+1)]$

610 $x^3 - 4x^2 - 3x + 18$ $[(x+2)(x-3)^2]$

611 $(k+1)^2 + 2(k+1) + 1$ $[(k+2)^2]$

612 $2a^3b - 8ab^3$ $[2ab(a-2b)(a+2b)]$

FRAZIONI ALGEBRICHE

448 $\dfrac{ax-2x}{a-2} + \dfrac{ax+3x}{a+3}$ [2x]

449 $\dfrac{x-3}{x^2-6x+9} + \dfrac{1}{3-x}$ [0]

450 $\left[x + \dfrac{1}{x-1} + \dfrac{1}{(x-1)^2}\right]^4 \left[x - \dfrac{1}{1-x} + \dfrac{1}{(1-x)^2}\right]^{-4}$ [1]

451 $\left(\dfrac{3-a}{a-2}\right)^{-5} \left(\dfrac{a}{a-4}\right)^{8} \left(\dfrac{a-3}{2-a}\right)^{5} \left(\dfrac{a}{4-a}\right)^{-8}$ [1]

Semplifica le seguenti espressioni.

452 $\dfrac{3y}{y-1} - \dfrac{1-2y}{y-1} + \dfrac{4}{1-y}$ [5]

453 $\left(\dfrac{x^2-1}{x^2+5x+6} \cdot \dfrac{x^2+6x+9}{2x+2}\right) : \dfrac{9x-9}{4}$ $\left[\dfrac{2(x+3)}{9(x+2)}\right]$

454 $\left(\dfrac{1}{x^2+x-2} - \dfrac{1}{2x^2+4x}\right) : \dfrac{1}{4x^2+8x}$ $\left[\dfrac{2(x+1)}{x-1}\right]$

455 $\dfrac{\dfrac{1}{x+h} - \dfrac{1}{x}}{h}$ $\left[\dfrac{1}{x(x+h)}\right]$

456 $\dfrac{m^2-1}{m^2-6m+5} : \left(\dfrac{m-3}{1-m} + \dfrac{m-2}{m+1}\right)^{-1}$ $\left[\dfrac{1}{1-m}\right]$

457 $\dfrac{\dfrac{1}{(x+h)^2} - \dfrac{1}{x^2}}{h}$ $\left[\dfrac{2x+h}{x^2(x+h)^2}\right]$

458 $\dfrac{a^{-1}+b^{-1}}{a^{-2}-b^{-2}}$ $\left[\dfrac{ab}{b-a}\right]$

459 $\dfrac{y^2-16}{3-y} : \left(\dfrac{y}{y-3} - \dfrac{2y-4}{y-3}\right) + \left(\dfrac{y+1}{y^2-3y-4}\right)^{-1}$ [2y]

460 $\left(1 + \dfrac{1}{x-1} + \dfrac{1}{x+2}\right) : \dfrac{x^2+3x-1}{x^2-4} + \dfrac{9-x^2}{x^2-4x+3}$ $\left[\dfrac{5}{1-x}\right]$

EQUAZ. DISEQUAZ. FRATTE

Risolvi le seguenti equazioni frazionarie.

8 $2-\frac{1}{x}=0$ $\left[\frac{1}{2}\right]$

9 $\frac{1}{x}+3=0$ $\left[-\frac{1}{3}\right]$

10 $\frac{2x+6}{x^2-1}=0$ $[-3]$

11 $\frac{x-1}{x^2+2x-3}=0$ [Impossibile]

12 $\frac{x-2}{x+3}=\frac{1}{2}$ $[7]$

13 $\frac{x-2}{x+3}=\frac{x+1}{x-1}$ $\left[-\frac{1}{7}\right]$

14 $\frac{x}{x-1}=\frac{x+2}{x-3}$ $\left[\frac{1}{2}\right]$

15 $\frac{2x}{x-3}=\frac{2x+1}{x+2}$ $\left[-\frac{1}{3}\right]$

27 $\frac{2}{x}-\frac{3}{x-1}=\frac{1}{2x^2-2x}$ $\left[-\frac{5}{2}\right]$

28 $\frac{1}{2x-4}-\frac{1}{x}-\frac{1}{2x+4}=-\frac{x}{x^2-4}$ [Impossibile]

29 $\frac{1}{x-2}-\frac{1}{x}-\frac{1}{x+2}=\frac{x}{4-x^2}$ $[-1]$

30 $\frac{1}{2x-1}-\frac{1}{1-4x^2}=\frac{2}{2x+1}$ $[2]$

31 $\frac{1}{x^2-4}+\frac{1}{x^2+2x}=\frac{3}{x^2-2x}$ $[-8]$

32 $\frac{1}{4x^2-4}+\frac{1}{3x+3}=\frac{1}{8x-8}$ [Impossibile]

33 $\frac{1}{x-1}+\frac{1}{x-2}=\frac{2}{x-3}$ $\left[\frac{5}{3}\right]$

34 $\frac{1}{x}-\frac{2}{x+2}=-\frac{1}{x+3}$ $[-6]$

Risolvi le seguenti disequazioni frazionarie.

A mente

6 $\frac{1}{x-3}>0$ $[x>3]$

7 $\frac{1}{x+2}<0$ $[x<-2]$

8 $-\frac{3}{2x-1}<0$ $\left[x>\frac{1}{2}\right]$

9 $-\frac{1}{3x}>0$ $[x<0]$

10 $\frac{2x-1}{5x+10}>0$ $\left[x<-2 \vee x>\frac{1}{2}\right]$

18 $\frac{5x+10}{20-4x}<0$ $[x<-2 \vee x>5]$

19 $\frac{0{,}5x-1}{x-0{,}5}\le 0$ $\left[\frac{1}{2}<x\le 2\right]$

20 $\frac{0{,}\overline{3}x-3}{0{,}3x-3}>0$ $[x<9 \vee x>10]$

21 $\frac{x-4^{-1}}{2^{-1}x-2}\le 0$ $\left[\frac{1}{4}\le x<4\right]$

22 $\frac{5-10x}{2x+6}\ge 0$ $\left[-3<x\le\frac{1}{2}\right]$

Risolvi le seguenti disequazioni frazionarie, dopo averle ricondotte in forma normale.

33 $\frac{1}{x-2}>2$ $\left[2<x<\frac{5}{2}\right]$

34 $\frac{1}{6-2x}<-3$ $\left[3<x<\frac{19}{6}\right]$

35 $\frac{1}{x+3}<1$ $[x<-3 \vee x>-2]$

36 $-\frac{1}{2x-1}\le 1$ $\left[x\le 0 \vee x>\frac{1}{2}\right]$

44 $-\frac{1}{x-5}>\frac{4}{5x-25}$ $[x<5]$

45 $\frac{1}{2x-2}+\frac{1}{1-x}\ge\frac{2}{3x-3}$ $[x<1]$

46 $\frac{x}{2-2x}+1\ge\frac{1}{3x-3}$ $\left[x<1 \vee x\ge\frac{8}{3}\right]$

47 $\frac{1}{x-1}\ge\frac{1}{2x-2}+\frac{1}{3}$ $\left[1<x\le\frac{5}{2}\right]$

Risolvi i seguenti sistemi contenenti anche disequazioni frazionarie o scomponibili in fattori.

170 $\begin{cases}\frac{x-4}{x+1}\ge 0\\ -4(2-x)\le 0\end{cases}$ $[x<-1]$

171 $\begin{cases}\frac{x-1}{4-x}\le 0\\ \frac{x-3}{4}<\frac{x}{6}\end{cases}$ $[x\le 1 \vee 4<x<9]$

172 $\begin{cases}\frac{1}{x}\ge 2\\ 2x-6<0\end{cases}$ $\left[0<x\le\frac{1}{2}\right]$

184 $\begin{cases}(x-3)^2<1\\ (2-x)(2+x)>x-x^2\end{cases}$ $[2<x<4]$

185 $\begin{cases}\frac{1}{5-x}>-1\\ \frac{x-1}{8}-\frac{x+1}{6}<\frac{x-3}{12}\end{cases}$ $\left[-\frac{1}{3}<x<5 \vee x>6\right]$

186 $\begin{cases}(x-2)^2<(x-4)(x+4)\\ 2x-\frac{1}{5}x^2>0\end{cases}$ $[5<x<10]$

EQUAZIONI DI 2^

Risolvi le seguenti equazioni (quando conveniente, applica la formula risolutiva ridotta).

175 $2x^2+3x=-1$ $\left[-\frac{1}{2};-1\right]$

176 $-x^2=x-12$ $[-4;3]$

177 $2x^2-5=-4x$ $\left[\frac{-2\pm\sqrt{14}}{2}\right]$

178 $2(x-1)=3x^2$ [Impossibile]

179 $x(x-2)=15$ $[-3;5]$

180 $2(x+3)(x+1)=x+15$ $\left[-\frac{9}{2};1\right]$

181 $(2x+3)(x+4)=-2$ $\left[-\frac{7}{2};-2\right]$

182 $(x-3)(2x-5)=3$ $\left[\frac{3}{2};4\right]$

183 $(x+1)^2=(2x-3)^2$ $\left[\frac{2}{3};4\right]$

184 $(2x-1)^2=3x(x-2)$ $[-1]$

185 $x(3-x)+x(2-x)=-25$ $\left[-\frac{5}{2};5\right]$

186 Video $2x(x-2)-(x-1)x+2=0$ $[2;1]$

187 $(2x+1)(x-2)-(x-1)(x+1)=9$ $[-2;5]$

188 $2x^2=(x+2)(x-3)+12$ $[-3;2]$

189 $(x-3)^2+(5-x)^2=2x-6$ $[4;5]$

Risolvi le seguenti equazioni nell'incognita x.

531 $\frac{2x-1}{4x^2+16x+15}+\frac{2}{2x+3}=\frac{x+4}{2x^2+9x+10}$ $[-1]$

532 $\frac{1}{2x^2-5x-12}+\frac{1}{4x^2+4x-3}=-\frac{1}{2x+3}$ $\left[\frac{3\pm\sqrt{11}}{2}\right]$

533 $\frac{7x+2}{2x^2+x-15}-\frac{10x-1}{3x^2+10x+3}=\frac{8x+7}{6x^2-13x-5}$ $\left[4;\frac{6}{7}\right]$

534 $\frac{1}{9x^2-6x+1}+\frac{16}{15x^2+25x-10}=\frac{1}{3x-1}$ $\left[-\frac{2}{15};2\right]$

DISEQUAZIONI DI 2^

Risolvi le seguenti disequazioni di secondo grado in forma normale.

176 $-x^2+3x\geq 0$ $[0\leq x\leq 3]$

177 $x^2+x+2<0$ [Impossibile]

178 $x^2+3x+5\geq 0$ $[\forall x\in\mathbb{R}]$

179 $x^2+7x\leq 0$ $[-7\leq x\leq 0]$

180 $x^2-4x-21\geq 0$ $[x\leq -3\vee x\geq 7]$

181 $x^2-6x+9\leq 0$ $[x=3]$

Risolvi le seguenti disequazioni di secondo grado, dopo averle ricondotte in forma normale.

198 $(x+1)^2\geq(2x-1)^2$ $[0\leq x\leq 2]$

199 Ragiona sul video $(x+1)^2-2x(x-2)\geq 6$ $[1\leq x\leq 5]$

200 $x^2\leq(2x+1)^2$ $\left[x\leq -1\vee x\geq -\frac{1}{3}\right]$

201 $(2x-3)^2-(x+11)^2\geq 0$ $\left[x\leq -\frac{8}{3}\vee x\geq 14\right]$

202 $(2x-1)^2+x\geq 3x-1$ $\left[x\leq\frac{1}{2}\vee x\geq 1\right]$

203 $\frac{1}{2}x-\frac{x+2}{3}\geq x^2+\frac{x}{3}$ [Impossibile]

205 $(x+1)^2+x^2-3x+6\leq 0$ [Impossibile]

206 $\frac{x^2+2}{4}+\frac{(x+1)^2}{2}>x^2+1$ $[0<x<4]$

207 $x^2+(x+3)^2>1+2x$ $[\forall x\in\mathbb{R}]$

208 $(x+1)^2-2x(x-2)\geq 6$ $[1\leq x\leq 5]$

209 $\frac{1}{2}(x-1)^2-x(3-x)>2$ $\left[x<-\frac{1}{3}\vee x>3\right]$

210 $\frac{x+2}{4}-\frac{x+1}{2}>x^2+1$ [Impossibile]

211 $(x-3)^2+x^2\geq 0{,}\overline{3}x+(x-1)(x+1)$ $\left[x\leq 3\vee x\geq\frac{10}{3}\right]$

Risolvi le seguenti disequazioni frazionarie.

274 $\frac{x}{x^2-16} \le 0$ $[x<-4 \vee 0 \le x<4]$

275 $\frac{6-2x}{x^2-4} < 0$ $[-2<x<2 \vee x>3]$

276 $\frac{x-1}{4-x^2} \le 0$ $[-2<x \le 1 \vee x>2]$

277 $\frac{2-x}{x^2-1} < 0$ $[-1<x<1 \vee x>2]$

278 $\frac{x^2-3x}{x^2-4} > 0$ $[x<-2 \vee 0<x<2 \vee x>3]$

279 $\frac{9x-x^2}{2x-12} \ge 0$ $[x \le 0 \vee 6<x \le 9]$

291 $\frac{4x^2-8x}{4x^2-3} \le 0$ $\left[-\frac{\sqrt{3}}{2}<x \le 0 \vee \frac{\sqrt{3}}{2}<x \le 2\right]$

292 $\frac{9-4x^2}{x^2-25} < 0$ $\left[x<-5 \vee -\frac{3}{2}<x<\frac{3}{2} \vee x>5\right]$

293 $\frac{x^2-4(x+1)^2}{3x-x^2} \le 0$ $\left[-2 \le x \le -\frac{2}{3} \vee 0<x<3\right]$

294 $\frac{(2x+1)^2-x^2}{2x-x^2-2} > 0$ $\left[-1<x<-\frac{1}{3}\right]$

295 $\frac{10-2x}{x^2-2x-4} \ge 0$ $[x<1-\sqrt{5} \vee 1+\sqrt{5}<x \le 5]$

296 $\frac{2x^2+5x-7}{2x} \ge 0$ $\left[-\frac{7}{2} \le x<0 \vee x \ge 1\right]$

Risolvi le seguenti disequazioni frazionarie, dopo averle ricondotte in forma normale.

312 $\frac{1}{x+2}-\frac{1}{x-1}>1$ $[-2<x<1]$

313 $\frac{x^2}{x+1}>\frac{1}{2}$ $\left[-1<x<-\frac{1}{2} \vee x>1\right]$

314 $x-3>\frac{1}{2x-5}$ $\left[2<x<\frac{5}{2} \vee x>\frac{7}{2}\right]$

315 $x+2>\frac{1}{x}$ $[-1-\sqrt{2}<x<0 \vee x>\sqrt{2}-1]$

316 $\frac{6}{x+2} \ge 3-x$ $[-2<x \le 0 \vee x \ge 1]$

327 $\frac{1}{2x+4}-\frac{1}{2-x} \ge \frac{1}{3x+6}$ $\left[-2<x \le -\frac{10}{7} \vee x>2\right]$

328 $\frac{1}{x^2-4} \le \frac{1}{x-2}-\frac{1}{2x+4}$ $[-4 \le x<-2 \vee x>2]$

329 $\frac{x+1}{2x+x^2}>\frac{3}{8}$ $\left[-2<x<-\frac{4}{3} \vee 0<x<2\right]$

330 $\frac{2}{1-x} \ge \frac{1}{x+2}$ $[x \le -5 \vee -2<x<1]$

331 $\frac{1}{x}+\frac{1}{x-3} \ge \frac{2}{x^2-3x}$ $\left[0<x \le \frac{5}{2} \vee x>3\right]$

Risolvi i seguenti sistemi che contengono anche disequazioni frazionarie.

379 $\begin{cases} 2x^2-3x-9 \le 0 \\ \frac{1}{2-x}<0 \end{cases}$ $[2<x \le 3]$

380 $\begin{cases} -\frac{1}{x-1}>0 \\ x^2+5x-6 \le 0 \end{cases}$ $[-6 \le x<1]$

381 $\begin{cases} \frac{x^2-4}{x+1} \ge 0 \\ 4x-x^2 \le 0 \end{cases}$ $[-2 \le x<-1 \vee x \ge 4]$

392 $\begin{cases} \frac{1}{x^2-1} \ge \frac{1}{x^2+x} \\ \frac{x-2}{3} \le \frac{1-x}{2} \end{cases}$ $\left[-1<x<0 \vee 1<x \le \frac{7}{5}\right]$

393 $\begin{cases} x-1 \le \frac{2(3-x)^2}{x} \\ -x^2-2x+3 \ge 0 \end{cases}$ $[0<x \le 1]$

394 $\begin{cases} \frac{x}{x^2+1}<\frac{2}{5} \\ x-2>\frac{1}{4-x} \end{cases}$ $[x>4]$

SISTEMI LINEARI

Risolvi i seguenti sistemi lineari con il metodo che ritieni più opportuno; giustifica la tua scelta.

263 $\begin{cases} y = 2x - 3 \\ y = -3x + 2 \end{cases}$ $[(1, -1)]$

264 $\begin{cases} 3x - 2y = 6 \\ 5x - 2y = 2 \end{cases}$ $[(-2, -6)]$

265 $\begin{cases} 2x - 3y = 8 \\ x + 5y = -3 \end{cases}$ $\left[\left(\frac{31}{13}, -\frac{14}{13}\right)\right]$

266 $\begin{cases} 7x - 11y = 8 \\ 7x - 11y - 7 = 0 \end{cases}$ [Impossibile]

267 $\begin{cases} 2(x - y + 2) = x + y \\ 2x - 6y = 3 \end{cases}$ [Impossibile]

268 $\begin{cases} x + y = 2^{-1} \\ x - y = 2^{-2} \end{cases}$ $\left[\left(\frac{3}{8}, \frac{1}{8}\right)\right]$

269 $\begin{cases} y = -2x + 1 \\ x = -y - 3 \end{cases}$ $[(4, -7)]$

270 $\begin{cases} 6x - 5y = -1 \\ 3x - 2y = 3 \end{cases}$ $\left[\left(\frac{17}{3}, 7\right)\right]$

278 $\begin{cases} 0{,}1x + 0{,}2y = 0{,}4 \\ x - y = -4 \end{cases}$ $\left[\left(-\frac{4}{3}, \frac{8}{3}\right)\right]$

279 $\begin{cases} \frac{1}{5}\left(x - \frac{1}{2}\right) + \frac{1}{2}(y - 1) = \frac{2x - y}{5} \\ x^2 + y = (x - 1)(x + 1) - x \end{cases}$ $\left[\left(-\frac{13}{9}, \frac{4}{9}\right)\right]$

280 $\begin{cases} x - 2y = -2 \\ \frac{x + 1}{2} = \frac{x - y}{3} \end{cases}$ $\left[\left(-\frac{5}{2}, -\frac{1}{4}\right)\right]$

281 $\begin{cases} 2(x - 3) = 3(y - 2) \\ \frac{1}{2}x = \frac{y - 2}{12} \end{cases}$ $\left[\left(-\frac{3}{8}, -\frac{1}{4}\right)\right]$

282 $\begin{cases} -2(x + y) + 3(x - 2y) = -4(x - y) \\ x = y + 2 \end{cases}$ $\left[\left(\frac{24}{7}, \frac{10}{7}\right)\right]$

283 $\begin{cases} \frac{2x - y}{4} = \frac{x + 3y}{3} \\ x(x - y) = (x + 1)(x - y) - 13 \end{cases}$ $[(15, 2)]$

284 $\begin{cases} \frac{1}{2}(2x - y) = \frac{y}{3} - \frac{1}{6} \\ (x - y - 1)^2 = (x - y)^2 + 2 \end{cases}$ $\left[\left(\frac{3}{2}, 2\right)\right]$

313 $\begin{cases} 6x\sqrt{2} - y\sqrt{3} = 9\sqrt{2} \\ x\sqrt{3} - y\sqrt{2} = 3\sqrt{3} \end{cases}$ $[(1, -\sqrt{6})]$

314 $\begin{cases} x + (\sqrt{2} + 1)y = 4 + \sqrt{2} \\ 3x - \sqrt{6}\,y - 1 = 5 - 2\sqrt{3} \end{cases}$ $[(2, \sqrt{2})]$

334 $\begin{cases} 3x - 2y + z = -1 \\ x + y - z = 2 \\ x + 2y + 2z = 1 \end{cases}$ $\left[\left(\frac{9}{19}, \frac{17}{19}, -\frac{12}{19}\right)\right]$

335 $\begin{cases} x - y + 2z = 1 \\ 2x + y - z = 2 \\ x - y + 3z = 4 \end{cases}$ $[(0, 5, 3)]$

336 $\begin{cases} x - y + 2z = -1 \\ 2x + y - z = 2 \\ x - 2y + 3z = 1 \end{cases}$ $[(2, -7, -5)]$

337 $\begin{cases} 3x - 2y + z = -1 \\ x + y - z = 2 \\ x + 2y - z = 5 \end{cases}$ $[(1, 3, 2)]$

346 $\begin{cases} 2x - 4y + z = 2 \\ x + 2y - z = -1 \\ x + y - 3z = 0 \end{cases}$ $\left[\left(-\frac{1}{19}, -\frac{11}{19}, -\frac{4}{19}\right)\right]$

347 $\begin{cases} x + y - z = 1 \\ 2x - y + 2z = 3 \\ x + y - 2z = -1 \end{cases}$ $\left[\left(\frac{2}{3}, \frac{7}{3}, 2\right)\right]$

348 $\begin{cases} x - y - z = 2 \\ x + y + 2z = 1 \\ 2x + 3y - z = -1 \end{cases}$ $\left[\left(\frac{17}{13}, -\frac{14}{13}, \frac{5}{13}\right)\right]$

349 $\begin{cases} 2x + y - z = 1 \\ 2x - y + 2z = 5 \\ x + y + z = -1 \end{cases}$ $\left[\left(\frac{14}{9}, -\frac{7}{3}, -\frac{2}{9}\right)\right]$