**Compiti di MATEMATICA per le vacanze per le FUTURE 2 LES**

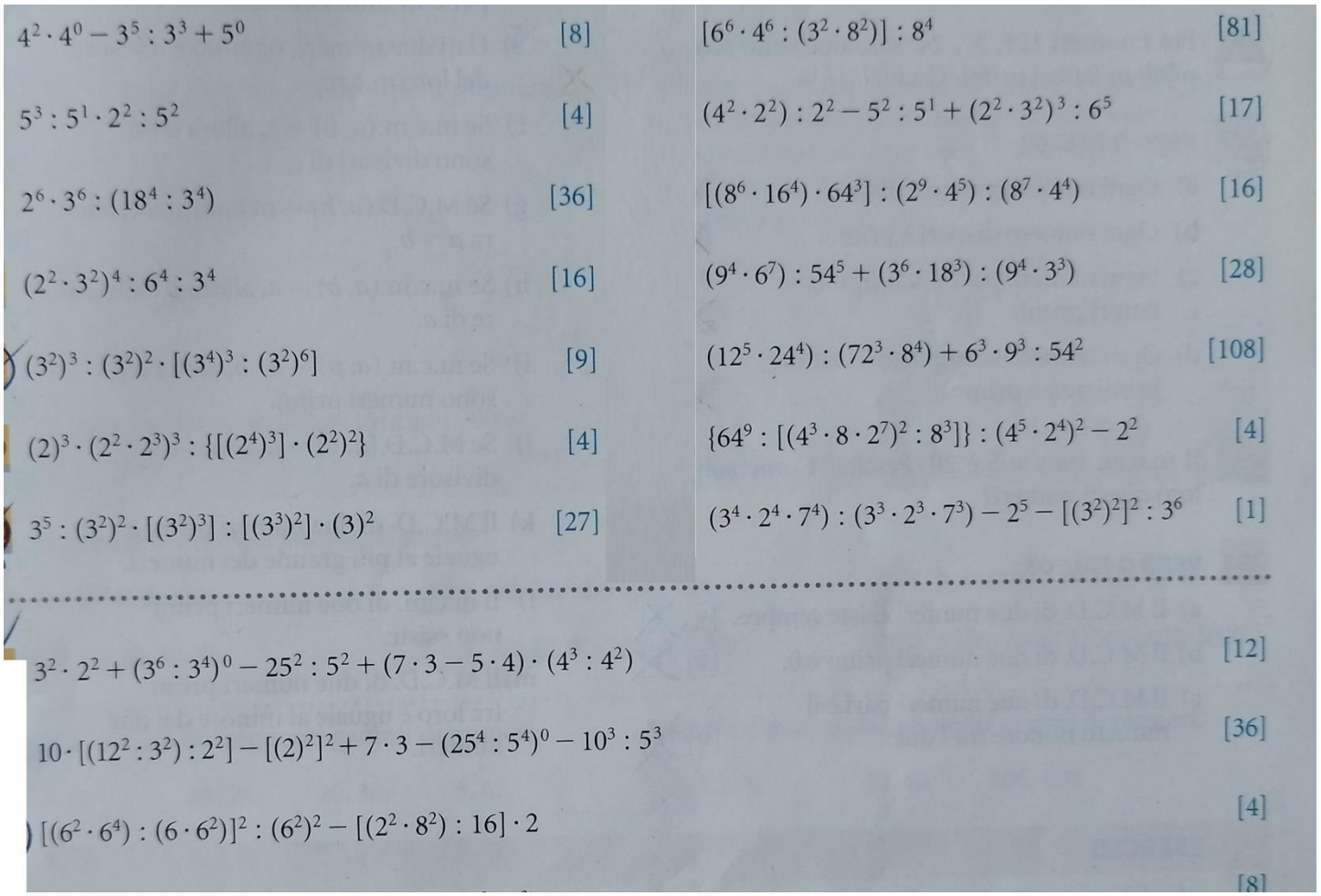
**Ripassare:**

- **Insiemi e le loro operazioni**
- **Frazioni, MCD, mcm e le espressioni con le frazioni**
- **Monomi e polinomi e le operazioni fra di loro**
- **Prodotti notevoli**
- **Equazioni**
- **Disequazioni**
- **Equazioni fratte**
- **Disequazioni fratte**

**Risolvi i esercizi inserendo sempre le regole che utilizzi, ad esempio il calcolo dell'mcm nelle espressioni delle frazioni o la regola relativa al prodotto notevole utilizzato**

**Per chi deve Rafforzare la Preparazione gli esercizi da eseguire sono invece il doppio di quelli indicati fra parentesi. Rivedere ed eventualmente rielaborare le regole inserite nel drive.**

**Esercizi: Proprietà delle potenze** (svolgere almeno 8 esercizi fra quelle sottostanti)



$4^2 \cdot 4^0 - 3^5 : 3^3 + 5^0$ [8]

$5^3 : 5^1 \cdot 2^2 : 5^2$ [4]

$2^6 \cdot 3^6 : (18^4 : 3^4)$ [36]

$(2^2 \cdot 3^2)^4 : 6^4 : 3^4$ [16]

$(3^2)^3 : (3^2)^2 \cdot [(3^4)^3 : (3^2)^6]$ [9]

$(2)^3 \cdot (2^2 \cdot 2^3)^3 : \{[(2^4)^3] \cdot (2^2)^2\}$ [4]

$3^5 : (3^2)^2 \cdot [(3^2)^3] : [(3^3)^2] \cdot (3)^2$ [27]

$[6^6 \cdot 4^6 : (3^2 \cdot 8^2)] : 8^4$ [81]

$(4^2 \cdot 2^2) : 2^2 - 5^2 : 5^1 + (2^2 \cdot 3^2)^3 : 6^5$ [17]

$[(8^6 \cdot 16^4) \cdot 64^3] : (2^9 \cdot 4^5) : (8^7 \cdot 4^4)$ [16]

$(9^4 \cdot 6^7) : 54^5 + (3^6 \cdot 18^3) : (9^4 \cdot 3^3)$ [28]

$(12^5 \cdot 24^4) : (72^3 \cdot 8^4) + 6^3 \cdot 9^3 : 54^2$ [108]

$\{64^9 : [(4^3 \cdot 8 \cdot 2^7)^2 : 8^3]\} : (4^5 \cdot 2^4)^2 - 2^2$ [4]

$(3^4 \cdot 2^4 \cdot 7^4) : (3^3 \cdot 2^3 \cdot 7^3) - 2^5 - [(3^2)^2]^2 : 3^6$ [1]

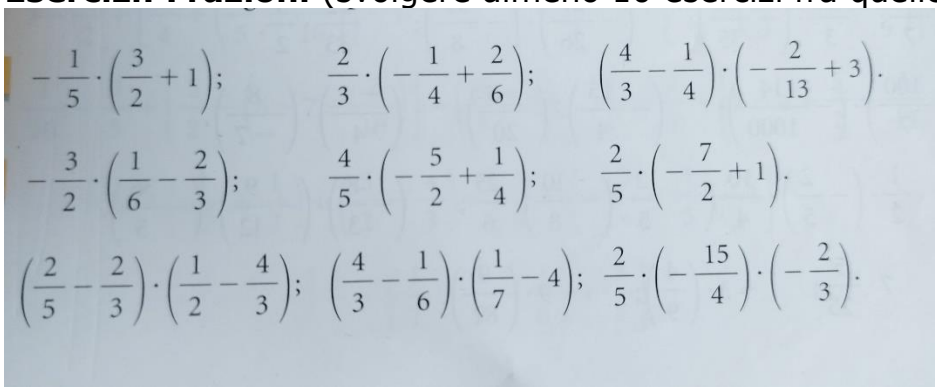
$3^2 \cdot 2^2 + (3^6 : 3^4)^0 - 25^2 : 5^2 + (7 \cdot 3 - 5 \cdot 4) \cdot (4^3 : 4^2)$ [12]

$10 \cdot [(12^2 : 3^2) : 2^2] - [(2)^2]^2 + 7 \cdot 3 - (25^4 : 5^4)^0 - 10^3 : 5^3$ [36]

$[(6^2 \cdot 6^4) : (6 \cdot 6^2)]^2 : (6^2)^2 - [(2^2 \cdot 8^2) : 16] \cdot 2$ [4]

[8]

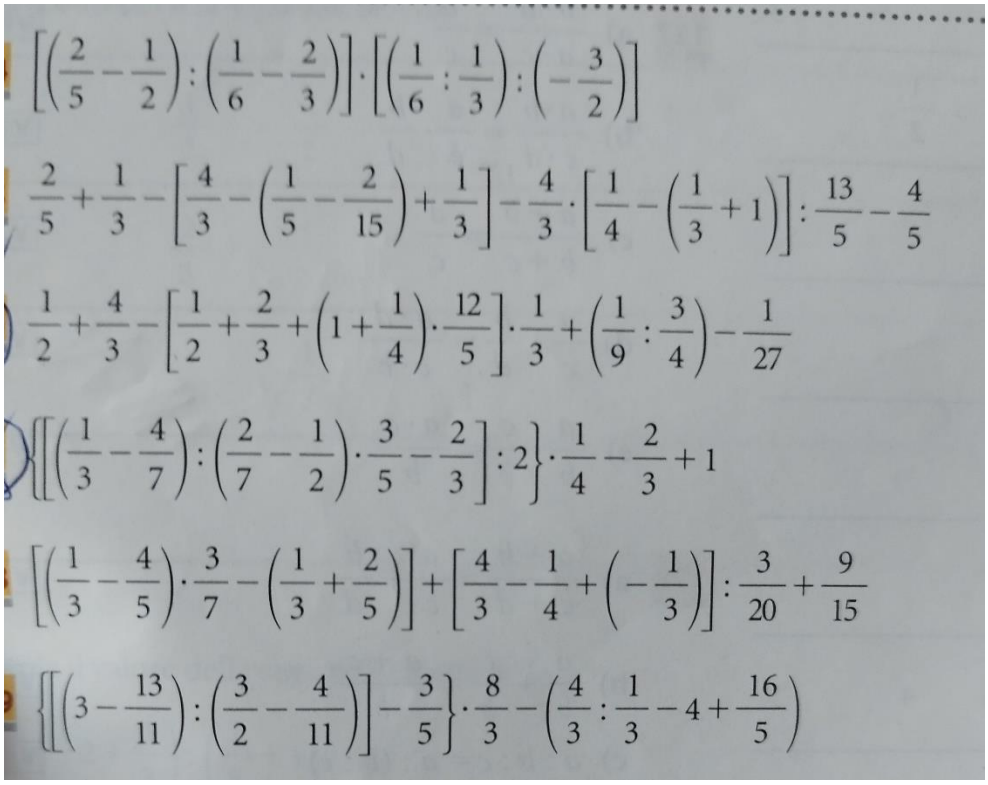
**Esercizi: Frazioni** (svolgere almeno 10 esercizi fra quelle sottostanti)



$$-\frac{1}{5}\cdot\left(\frac{3}{2}+1\right); \qquad \frac{2}{3}\cdot\left(-\frac{1}{4}+\frac{2}{6}\right); \qquad \left(\frac{4}{3}-\frac{1}{4}\right)\cdot\left(-\frac{2}{13}+3\right)\cdot$$

$$-\frac{3}{2}\cdot\left(\frac{1}{6}-\frac{2}{3}\right); \qquad \frac{4}{5}\cdot\left(-\frac{5}{2}+\frac{1}{4}\right); \qquad \frac{2}{5}\cdot\left(-\frac{7}{2}+1\right)\cdot$$

$$\left(\frac{2}{5}-\frac{2}{3}\right)\cdot\left(\frac{1}{2}-\frac{4}{3}\right); \quad \left(\frac{4}{3}-\frac{1}{6}\right)\cdot\left(\frac{1}{7}-4\right); \quad \frac{2}{5}\cdot\left(-\frac{15}{4}\right)\cdot\left(-\frac{2}{3}\right)\cdot$$



$$\left[\left(\frac{2}{5}-\frac{1}{2}\right):\left(\frac{1}{6}-\frac{2}{3}\right)\right]\cdot\left[\left(\frac{1}{6}:\frac{1}{3}\right):\left(-\frac{3}{2}\right)\right]$$

$$\frac{2}{5}+\frac{1}{3}-\left[\frac{4}{3}-\left(\frac{1}{5}-\frac{2}{15}\right)+\frac{1}{3}\right]-\frac{4}{3}\cdot\left[\frac{1}{4}-\left(\frac{1}{3}+1\right)\right]:\frac{13}{5}-\frac{4}{5}$$

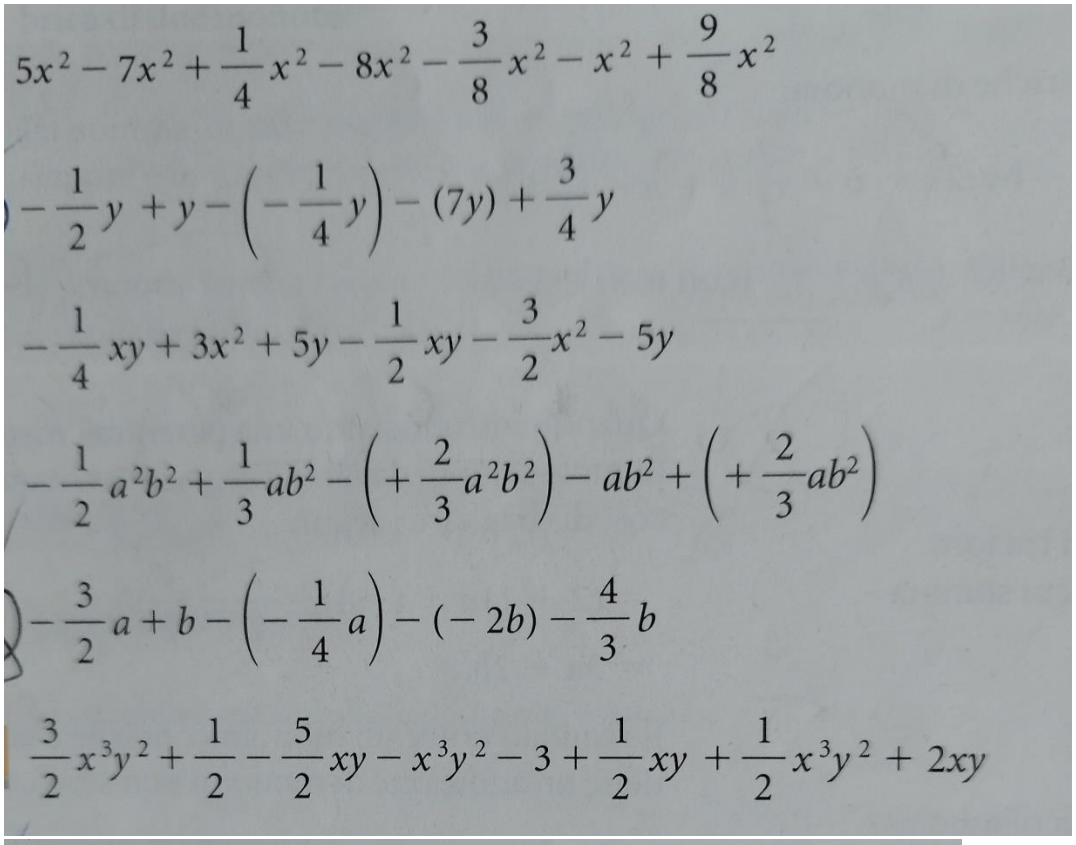
$$\frac{1}{2}+\frac{4}{3}-\left[\frac{1}{2}+\frac{2}{3}+\left(1+\frac{1}{4}\right)\cdot\frac{12}{5}\right]\cdot\frac{1}{3}+\left(\frac{1}{9}:\frac{3}{4}\right)-\frac{1}{27}$$

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

$$\left[\left(\frac{1}{3}-\frac{4}{5}\right)\cdot\frac{3}{7}-\left(\frac{1}{3}+\frac{2}{5}\right)\right]+\left[\frac{4}{3}-\frac{1}{4}+\left(-\frac{1}{3}\right)\right]:\frac{3}{20}+\frac{9}{15}$$

$$\left\{\left[\left(3-\frac{13}{11}\right):\left(\frac{3}{2}-\frac{4}{11}\right)\right]-\frac{3}{5}\right\}\cdot\frac{8}{3}-\left(\frac{4}{3}:\frac{1}{3}-4+\frac{16}{5}\right)$$

**Esercizi: Monomi e Polinomi** (svolgere almeno 20 esercizi fra quelli sottostanti)



$$5x^2 - 7x^2 + \frac{1}{4}x^2 - 8x^2 - \frac{3}{8}x^2 - x^2 + \frac{9}{8}x^2$$

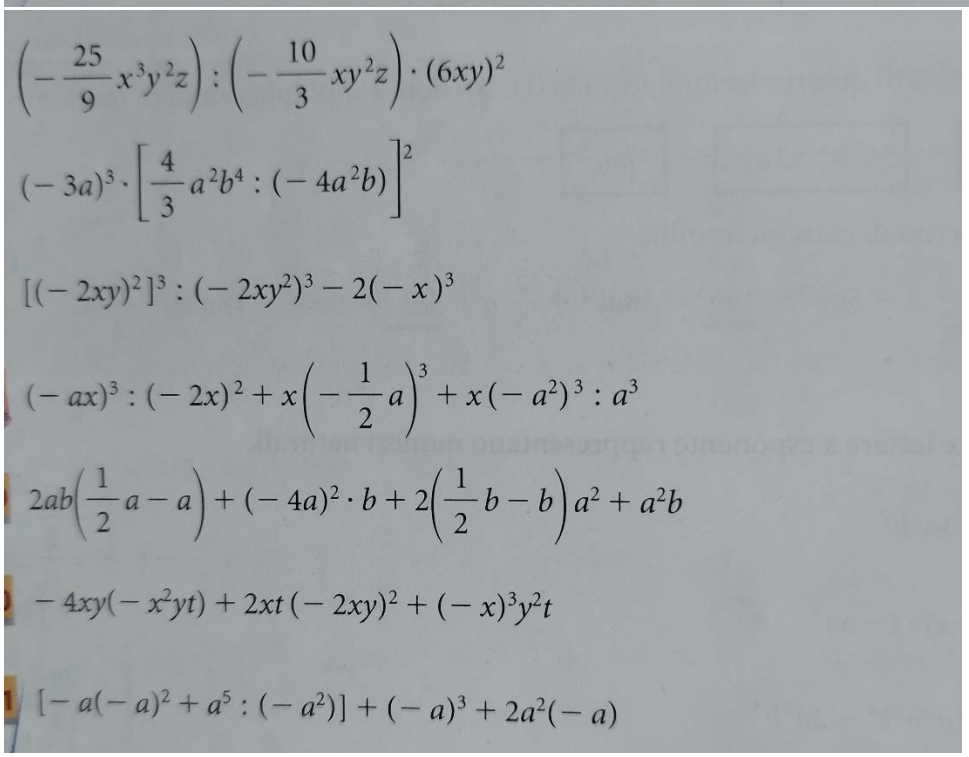
$$-\frac{1}{2}y + y - \left(-\frac{1}{4}y\right) - (7y) + \frac{3}{4}y$$

$$-\frac{1}{4}xy + 3x^2 + 5y - \frac{1}{2}xy - \frac{3}{2}x^2 - 5y$$

$$-\frac{1}{2}a^2b^2 + \frac{1}{3}ab^2 - \left(+\frac{2}{3}a^2b^2\right) - ab^2 + \left(+\frac{2}{3}ab^2\right)$$

$$-\frac{3}{2}a + b - \left(-\frac{1}{4}a\right) - (-2b) - \frac{4}{3}b$$

$$\frac{3}{2}x^3y^2 + \frac{1}{2} - \frac{5}{2}xy - x^3y^2 - 3 + \frac{1}{2}xy + \frac{1}{2}x^3y^2 + 2xy$$



$$\left(-\frac{25}{9}x^3y^2z\right) : \left(-\frac{10}{3}xy^2z\right) \cdot (6xy)^2$$

$$(-3a)^3 \cdot \left[\frac{4}{3}a^2b^4 : (-4a^2b)\right]^2$$

$$[(-2xy)^2]^3 : (-2xy^2)^3 - 2(-x)^3$$

$$(-ax)^3 : (-2x)^2 + x\left(-\frac{1}{2}a\right)^3 + x(-a^2)^3 : a^3$$

$$2ab\left(\frac{1}{2}a - a\right) + (-4a)^2 \cdot b + 2\left(\frac{1}{2}b - b\right)a^2 + a^2b$$

$$-4xy(-x^2yt) + 2xt(-2xy)^2 + (-x)^3y^2t$$

$$[-a(-a)^2 + a^5 : (-a^2)] + (-a)^3 + 2a^2(-a)$$

**Esercizi: Prodotti Notevoli** (svolgere almeno 15 esercizi fra quelle sottostanti)

$(2a-b)^2-(3a+b)(a-2b)+5a^2-ab$

$(x+y)^2-2y(x-y)-(x+y)(y-x)$

$(a^2+b^2)(a^2-b^2)-(a^2+b^2)^2+2a^2(a^2+b^2)$

$(x+1)^3+3(x+1)^2+3(x+1)+1$

$(y-3x)^2+2(2x+y)(y-2x)-9x^2-2xy-(2y-x)^2$

$(x^2-3y^2)(2x^2+y^2)-(x^2+2y^2)(x^2-2y^2)-(x^2+y^2)^2$

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

$(-x+y^2)(-x-y^2)+(-2y)^2(x-y)^2+8xy^3-4x^2(1+y^2)$

$(x+2)^2-3(x+2)(x-2)+(x-2)^3-x^2(x-8)$

$(1-2x)^2+(x+2)^2-5(x^2-2)$

$\left(\frac{1}{2}-a\right)^2-3\left(a-\frac{1}{2}\right)\left(a+\frac{1}{2}\right)+2(a-1)^2$

$(y^2-x)^2+y^2(2x-y^2)-(-x-3)^2$

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

$(x-2y)^2+(2x+y)(x-2y)-3x(x-3y)$

$\left(\frac{3}{2}a-2b\right)^2-\left(-\frac{1}{2}a+3b\right)^2-2(-a)^2$

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

$(a-1)^2-(a-1)(a+1)(a^2-1)+(a^2+1)^2$

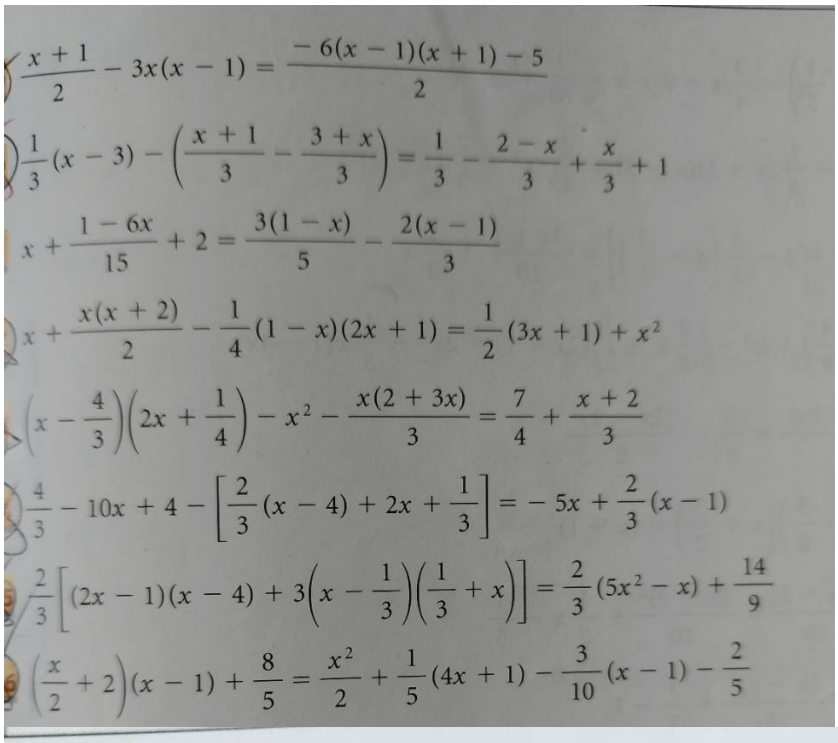
$[(2a-b)^2+4ab]^2-7a^2(2a^2+b^2)+(2a^2+b^2)(2a^2-b^2)$

$(a+y-2)(a+y+2)-(a-y)^2-4(ay-1)+1$

$(2-x)^2+(x-2)(-2-x)+(x-1+y)(x-1-y)-x(x-6)$

$(x+3)^2-(6+x)(x-6)-(1-x)^2+x(x-8)$

**Esercizi: Equazioni** (svolgere almeno 15 equazioni fra quelle sottostanti)



$$\frac{x+1}{2} - 3x(x-1) = \frac{-6(x-1)(x+1)-5}{2}$$

$$\frac{1}{3}(x-3) - \left(\frac{x+1}{3} - \frac{3+x}{3}\right) = \frac{1}{3} - \frac{2-x}{3} + \frac{x}{3} + 1$$

$$x + \frac{1-6x}{15} + 2 = \frac{3(1-x)}{5} - \frac{2(x-1)}{3}$$

$$x + \frac{x(x+2)}{2} - \frac{1}{4}(1-x)(2x+1) = \frac{1}{2}(3x+1) + x^2$$

$$\left(x - \frac{4}{3}\right)\left(2x + \frac{1}{4}\right) - x^2 - \frac{x(2+3x)}{3} = \frac{7}{4} + \frac{x+2}{3}$$

$$\frac{4}{3} - 10x + 4 - \left[\frac{2}{3}(x-4) + 2x + \frac{1}{3}\right] = -5x + \frac{2}{3}(x-1)$$

$$\frac{2}{3}\left[(2x-1)(x-4) + 3\left(x - \frac{1}{3}\right)\left(\frac{1}{3} + x\right)\right] = \frac{2}{3}(5x^2 - x) + \frac{14}{9}$$

$$\left(\frac{x}{2} + 2\right)(x-1) + \frac{8}{5} = \frac{x^2}{2} + \frac{1}{5}(4x+1) - \frac{3}{10}(x-1) - \frac{2}{5}$$

$$3(2x-1) + (2x-7) = 3(x+1) - (-3x-1) + 3x + 2$$

$$1 - [2 - 3(x+1)] = 2(2+x) - 4x$$

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

$$7 + 3x - [1 - x + x(x-3)] = x(1-x)$$

$$6 - (1-2x) + x(4-x) = 1 - x(2+x)$$

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

$$(x-2)^2 - 8 + x = x(x-6)$$

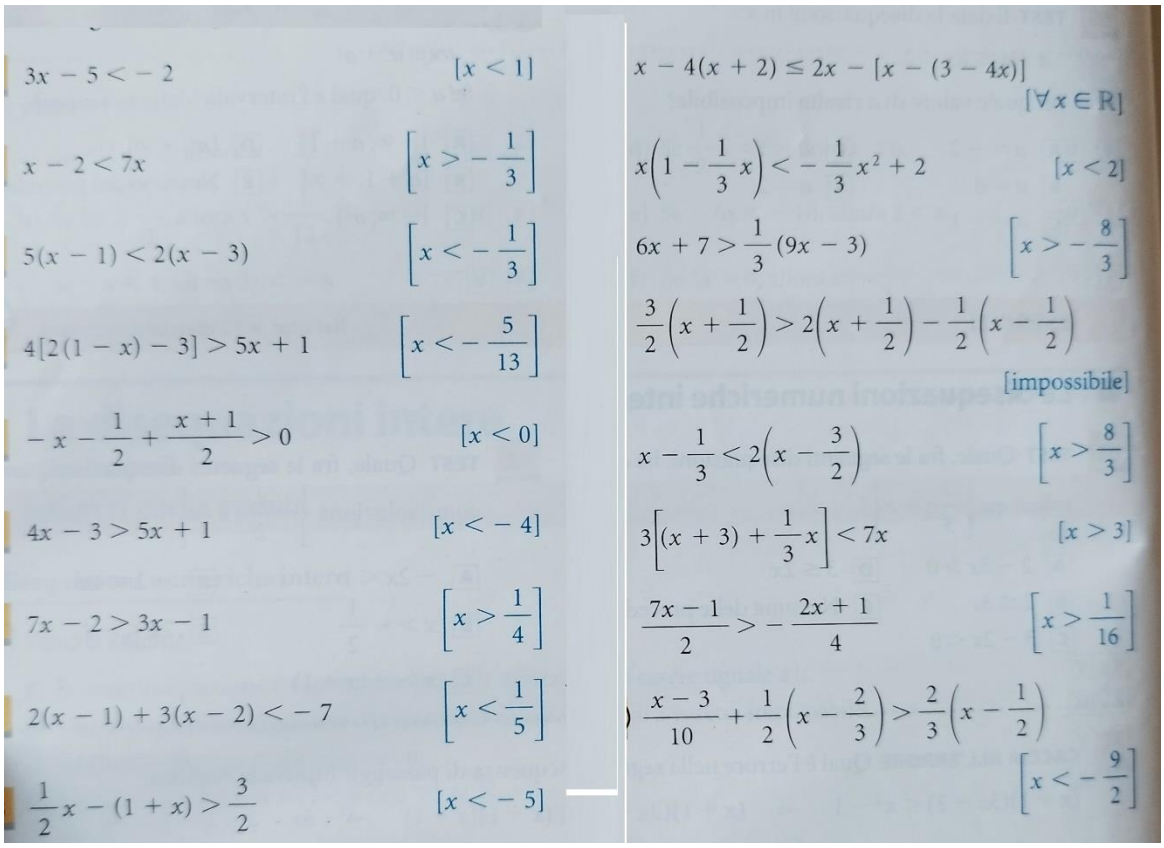
$$(2x+1)(x-3) - 2x = 2(x-1)^2 + 1$$

$$(x-3)(x+3) - [-(2-x) + 5] = 2 + x(x+1)$$

$$6 - 2x - (2 - x^2) = 1 + (x-3)^2$$

$$x(x+7) + 9 = x + (x+3)^2$$

**Esercizi: Disequazioni** (svolgere almeno 8 disequazioni fra quelle sottostanti)



$3x - 5 < -2$ $[x < 1]$

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

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

$4[2(1 - x) - 3] > 5x + 1$ $\left[x < -\frac{5}{13}\right]$

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

$4x - 3 > 5x + 1$ $[x < -4]$

$7x - 2 > 3x - 1$ $\left[x > \frac{1}{4}\right]$

$2(x - 1) + 3(x - 2) < -7$ $\left[x < \frac{1}{5}\right]$

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

$x - 4(x + 2) \leq 2x - [x - (3 - 4x)]$ $[\forall x \in \mathbb{R}]$

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

$6x + 7 > \frac{1}{3}(9x - 3)$ $\left[x > -\frac{8}{3}\right]$

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

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

$3\left[(x + 3) + \frac{1}{3}x\right] < 7x$ $[x > 3]$

$\frac{7x - 1}{2} > -\frac{2x + 1}{4}$ $\left[x > \frac{1}{16}\right]$

$\frac{x - 3}{10} + \frac{1}{2}\left(x - \frac{2}{3}\right) > \frac{2}{3}\left(x - \frac{1}{2}\right)$ $\left[x < -\frac{9}{2}\right]$