

Compiti di matematica per le vacanze estive

Cari ragazzi,

vi elenco di seguito i compiti di matematica che dovrete svolgere durante l'estate; vi ricordo di concedervi almeno un mese di meritato riposo, ma prima o poi dovrete rimettervi al lavoro per tornare a scuola preparati ad affrontare il nuovo anno.

Vi invito a leggere il capitolo sulla statistica e a provare a fare qualche esercizio: una volta tornati a scuola riprenderemo l'argomento insieme, ma se vi portate avanti con lo studio sarà tutto più facile e veloce.

A inizio anno faremo una verifica relativa agli argomenti dell'anno precedente basata sugli esercizi che vi allego in PDF.

Ai DSA chiedo di rivedere tutte le mappe concettuali fatte durante l'anno e di conservarle per il prossimo anno scolastico.

Godetevi l'estate!!

Un caro saluto,

Prof. Garbarino

Esegui le seguenti divisioni, applicando la regola di Ruffini. Nei risultati indichiamo il resto R solo se è diverso da 0.

$$(a^2 - a - 12) : (a - 4) \quad [Q = a + 3]$$

$$(2x^3 - 9x + 1) : (x - 3) \quad [Q = 2x^2 + 6x + 9; R = 28]$$

$$(3x^3 + x^2 - 8x + 4) : (x + 2) \quad [Q = 3x^2 - 5x + 2]$$

$$(b^3 + b^2 - b + 15) : (b + 3) \quad [Q = b^2 - 2b + 5]$$

$$(-3x^2 + 2x^3 - x + 2) : (x - 1) \quad [Q = 2x^2 - x - 2]$$

$$(x^3 + 17x - 7x^2 - 18) : (x - 4) \quad [Q = x^2 - 3x + 5; R = 2]$$

$$(x^4 - 5x^5 + x^2 + 2) : (x + 1) \quad [Q = -5x^4 + 6x^3 - 6x^2 + 7x - 7; R = 9]$$

$$(b^4 - 2b^2 + 3) : (b - 2) \quad [Q = b^3 + 2b^2 + 2b + 4; R = 11]$$

$$(5x^3 - 3x^2 + 4x - 2) : (x - 1) \quad [Q = 5x^2 + 2x + 6; R = 4]$$

$$(x^3 - 3x + 2) : (x + 2) \quad [Q = x^2 - 2x + 1]$$

$$(2x^3 - 13x^2 + 4 + 19x) : (x - 4) \quad [Q = 2x^2 - 5x - 1]$$

$$\left(\frac{1}{4}x^5 - 4x^3 + 8x + 2\right) : (x - 2) \quad [Q = \frac{1}{4}x^4 + \frac{1}{2}x^3 - 3x^2 - 6x - 4; R = -6]$$

$$\left(2b^3 - \frac{11}{3}b^2 - \frac{1}{3} + 2b\right) : \left(b - \frac{1}{3}\right) \quad [Q = 2b^2 - 3b + 1]$$

$$\left(7a^3 + \frac{27}{2}a^2 + \frac{3}{2} + \frac{11}{2}a\right) : \left(a + \frac{3}{2}\right) \quad [Q = 7a^2 + 3a + 1]$$

$$\left(4a^4 + 2a^2 + 4a^3 + a + \frac{1}{4}\right) : \left(a + \frac{1}{2}\right) \quad [Q = 4a^3 + 2a^2 + a + \frac{1}{2}]$$

$$\left(\frac{1}{2}x^5 - \frac{3}{4}x^4 - 2x^2 + 3\right) : (x - 2) \quad [Q = \frac{1}{2}x^4 + \frac{1}{4}x^3 + \frac{1}{2}x^2 - x - 2; R = -1]$$

$$(a^5 - 10a - 12) : (a - 2) \quad [Q = a^4 + 2a^3 + 4a^2 + 8a + 6]$$

$$(2a^3 - 3a^2 - 1) : (a + 3) \quad [Q = 2a^2 - 9a + 27; R = -82]$$

$$\left(-\frac{3}{2}b^3 + 9b^2 - 17b + 20\right) : (b - 4) \quad [Q = -\frac{3}{2}b^2 + 3b - 5]$$

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

$$\left(2y^5 + 2y^3 - y^2 + \frac{7}{8}y - 4y^4 - \frac{1}{4}\right) : \left(y - \frac{1}{2}\right) \quad [Q = 2y^4 - 3y^3 + \frac{1}{2}y^2 - \frac{3}{4}y + \frac{1}{2}]$$

Calcola il resto delle seguenti divisioni senza eseguirle.

$$(2x^3 - 9x + 1) : (x - 3)$$

$$(a^2 - a + 3 - 2a^3) : (a - 1)$$

$$\left(2x^3 - \frac{11}{3}x^2 + 2x - \frac{1}{3}\right) : \left(x - \frac{1}{3}\right)$$

$$(5b^6 + 15b^5 + 20 + 5b) : (b + 3)$$

$$\left(\frac{1}{2}y^5 - y^3 + 2y - 4\right) : (y + 2)$$

$$(2x^3 - 5x + 4) : (x + 1)$$

$$(2x^4 + x^3 - 6x + 1) : (x - 1)$$

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

$$(2y^5 + y^2 - y - 26) : (y - 2)$$

$$\left(\frac{2}{9}a^2 - a^4 - \frac{1}{3}a^3 + 2a + 5\right) : (a + 3)$$

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

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

$$(15a - 5b - 9a^2 - b^2 + 6ab) : (b - 3a)$$

$$(2x^4 - 5a^2x^2 + 4ax^3 - 3a^3x + 2a^5) : (x - a)$$

Semplifica le seguenti espressioni.

$$(2a - b)^2 - (3a + b)(a - 2b) + 5a^2 - ab \quad [6a^2 + 3b^2]$$

$$(x + y)^2 - 2y(x - y) - (x + y)(y - x) \quad [2x^2 + 2y^2]$$

$$(a^2 + b^2)(a^2 - b^2) - (a^2 + b^2)^2 + 2a^2(a^2 + b^2) \quad [2a^4 - 2b^4]$$

$$2(y - 3x)^2 + 2(2x + y)(y - 2x) - 9x^2 - 2xy - (2y - x)^2 \quad [-10xy]$$

$$(x^2 - 3y^2)(2x^2 + y^2) - (x^2 + 2y^2)(x^2 - 2y^2) - (x^2 + y^2)^2 \quad [-7x^2y^2]$$

$$[(2 - a)(2 + a) - 2]^3 - (2a^2 - b + 1)^2 + a^2(a^2 + 4)^2 + (b - 2a^2)^2 \quad [14a^4 + 2b + 7]$$

$$(-x + y^2)(-x - y^2) + (-2y)^2(x - y)^2 + 8xy^3 - 4x^2(1 + y^2) \quad [3y^4 - 3x^2]$$

$$(x - 2y)^3 - x(x - 2y)(x + 2y) + 2xy(3x + 4y) - (-2y)^3 \quad [24xy^2]$$

$$a(a^2 - 3) + (1 + 6a + a^3) - (a - 1)^3 + (-a - 1)^3 \quad [1 - 3a]$$

$$\left(\frac{1}{2}a^2 - b^2\right)^2 - \left(\frac{1}{2}a^2 + b^2\right)^2 + (-3ab)^2 \quad [7a^2b^2]$$

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

$$(4x^2 - y^2)^2 - (2x - y)^2(2x + y)^2 \quad [0]$$

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

$$\{[x^3 - y^3 + (x + y)^3 + 2x^2y - x(2x + 3y)(x + y)]^2 - 2\}^3 \quad [-8]$$

$$(x^2 - 2xy + 3y^2)(x^2 + 2xy + 3y^2) - 2(xy - x^2)^2 - 4x^3y + x^4 \quad [9y^4]$$

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

$$(1 - 2a^2)(1 + 2a^2) + (5a^2 - 1)^2 - 2(1 - 4a^2)^2 - [-2a^4 - (3a^2 - 1)^2] \quad [1]$$

$$[(x + y)^3 - (x + y)(x^2 - xy + y^2)]^2 - 2xy(-3xy)^2 \quad [9x^4y^2 + 9x^2y^4]$$

Scomponi in fattori, raccogliendo a fattore comune.

$$2ab - 4a^2;$$

$$2x^2y + 6xy^2 + 4y^3;$$

$$-2a^2 - 4a - 8;$$

$$x^4 + x^7 + x^5;$$

$$5x - 10xy + 15y;$$

$$-2a^2 + 4ab - 2a^3;$$

$$3a + 9b - 15;$$

$$6ax + 2a - 4a^2x^2;$$

$$\frac{2}{3}a^2y^3 + \frac{1}{3}ay^2;$$

$$18a^3y - 4a^4y^3 + 10a^5y^2;$$

$$\frac{1}{3}x^2y - \frac{1}{9}x^3y^2;$$

$$\frac{1}{2}a^2bc - \frac{1}{4}a^4bc + \frac{1}{8}a^3b^3;$$

$$\frac{5}{2}a^2b - \frac{15}{4}ab^2 + \frac{3}{4}ab;$$

$$a(x+y) + b(x+y);$$

$$(2a+b) - 3(b+2a);$$

$$(a+1)(a+2) + (-a-1)(a+3);$$

$$\frac{1}{2}a^3 + \frac{1}{2}a;$$

$$-3x^2 - 15x - 21;$$

$$a^2x + 12ax + 9ax^2;$$

$$2x^2y^2 + 2x^2y^3 - 4xy^2;$$

$$-27a^2 + 9ay - 18a;$$

$$cx^2 - 4cx + c^2x^2;$$

$$4a^4 - 2a^3 - 2a^6;$$

$$125x^2 - 25x + 25xy;$$

$$4x - 2x^2 - 2;$$

$$4x^3 + 3x^2y;$$

$$5x^3 - 15x^2y + 20x^4;$$

$$\frac{1}{3}a^4 - 3a^3;$$

$$\frac{4}{9}x^{18} - \frac{2}{3}x^6 + x^3;$$

$$4a(x+2y) - 2(x+2y);$$

$$x(a-1) - y(1-a);$$

$$2(x+y)(a+b) + \frac{1}{2}(x+y);$$

$$2ax - 4a + 2a^2.$$

$$a^3x^3 - x + ax^2.$$

$$-5y^2 + 15xy^2 - 25y.$$

$$\frac{1}{4}x^2y - \frac{1}{16}x^2.$$

$$-6a^3 + 9a^2b + 3a^2.$$

$$6xy^2 - 4x^2 + 10xy.$$

$$-3a^5 + 12a^3b - 6a^2.$$

$$12a^2b^3 + 30a^3b + 6ab.$$

$$\frac{2}{5}ax^2 + \frac{4}{5}a.$$

$$\frac{1}{9}y^3 - 3y^2.$$

$$4x^2y^5 - 12xy^6 - 6xy^5.$$

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

$$-2a^9 + 8a^4 + 2a^3.$$

$$x(a+b) - (a+b).$$

$$3(a-2x) - 2y(2x-a).$$

$$a(a-2) - ab(2-a).$$

Scomponi in fattori mediante il metodo del raccoglimento parziale.

$$5ay - y - 5a + 1$$

$$x^2y^2 + 1 + x^2 + y^2$$

$$5ax + 2ay + 5bx + 2by$$

$$3a^2b - 2a + 12ab - 8$$

$$x^3 + 12x^2 + 6x + 72$$

$$9ax - 6a + 12bx - 8b$$

$$(a - b)y - b + a$$

$$5ax + ay^2 - y^2 - 5x$$

$$3bx + x - 6b^2 - 2b$$

$$x^3y^2 + 2x^3y - ay - 2a$$

$$3ab - 6ac + b^2 - 2bc$$

$$12a^2 - 21b^3 - 28ab^2 + 9ab$$

$$y^4 - y^3 - 2y + 2$$

$$ax + 6x + ay + 6y$$

Scomponi in fattori i seguenti trinomi.

$$a^2 + 8a + 15;$$

$$a^2 + 4a - 21;$$

$$a^2 - 14a + 48;$$

$$a^2 + a - 20;$$

$$y^2 + 3y - 40;$$

$$a^2 + 13a + 40;$$

$$x^2 + 13x + 22;$$

$$a^2 - a - 56;$$

$$2x^9 + x^6 - 2x^3 - 1$$

$$-\frac{1}{27}a^3 - y^3$$

$$2a^2 + 2b^2 + 12a + 12b + 4ab + 18$$

$$6x^4 - 36x^2 + 6x^3$$

$$25x^2 + 5x - 2$$

$$x^{10} - 64x; \quad a^5 - 9a^3 + 8a^2 - 72$$

$$x^3 - 2x^2 - 9x + 18; \quad 5x^4y^4 - 10x^2y^2 + 5$$

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

$$2x(2y-3z)^2 - 8x^3$$

$$\frac{1}{64}x^6y^3 - \frac{27}{8}x^3y^6 + \frac{27}{16}x^4y^5 - \frac{9}{32}x^5y^4$$

$$\frac{25}{4}a^3 + \frac{4}{9}ab^2 + \frac{9}{25}a + 3a^2 - \frac{4}{5}ab - \frac{10}{3}a^2b$$

$$(x-3)^2 - 3(x-3) - 4$$

$$(x+y)^2 + 4z(x+y) - 6(x+y) + 4z^2 - 12z + 9$$

$$12x^4y + 16x^2y^3 - 2x^5 - 24x^3y^2; \quad \frac{3}{4}a^2x^6 - \frac{81}{4}a^2.$$

$$4a^2x^2 + 4y^4 + 4a^4 + x^4 + 4x^2y^2 + 8a^2y^2$$

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

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

$$[2(a+b+3)^2]$$

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

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

$$[x(x^3-4)(x^6+4x^3+16); (a+2)(a-3)(a+3)(a^2-2a+4)]$$

$$[(x+3)(x-3)(x-2); 5(xy+1)^2(xy-1)^2]$$

$$[x^2y^2(3x-y)^4]$$

$$[2x(2y-3z+2x)(2y-3z-2x)]$$

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

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

$$[(x-2)(x-7)]$$

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

$$\left[2x^2(2y-x)^3; \frac{3}{4}a^2(x^2-3)(x^4+3x^2+9) \right]$$

$$[(x^2+2y^2+2a^2)^2]$$

Scomponi in fattori, utilizzando la regola di Ruffini.

$$5x^2 - 4x - 1$$

$$[(x-1)(5x+1)]$$

$$2x^2 + 3x - 2$$

$$[(x+2)(2x-1)]$$

$$2a^3 - a^2 - 5a - 2$$

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

$$y^4 - y^3 + y^2 - 3y + 2$$

$$[(y-1)^2(y^2+y+2)]$$

$$x^3 - x^2 - 3x - 9$$

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

$$2b^3 + 5b^2 - 4b - 3$$

$$[(b-1)(b+3)(2b+1)]$$

$$3b^3 - 4b^2 + 5b - 4$$

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

$$t^3 - 39t + 70$$

$$[(t-2)(t-5)(t+7)]$$

Risolvi le seguenti equazioni numeriche nell'insieme dei numeri reali.

$$3x - 1 = 2x + 5;$$

$$-6x + 7 = 7 - 6x;$$

$$8x - 3 + 2x = 6x + 1 + 4x;$$

$$\frac{1}{6}(x - 1) = 0;$$

$$10^3 x - 4 \cdot 10^4 = 0;$$

$$0,06x = 600 \cdot 10^{-2};$$

$$-2^5 x + 4^6 = 0;$$

$$10^2 x - 10^4 = -2 \cdot 10^3;$$

$$8(x - 1) - 2(x + 3) = 3(2x - 1) - 5 - 17x$$

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

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

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

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

$$4(1 - x) - 2x = 3x + 1.$$

$$2x - 5 = x + 4 + x.$$

$$-3(x + 1) - 2 - 4x = 2.$$

$$\frac{x}{4} - x = 0.$$

$$\frac{x}{1 - \frac{1}{3}} = \frac{9}{4}.$$

$$\frac{-10x}{3} = -3^{-1}.$$

$$0,7x = 0,07.$$

$$[27 + (-3)^3]x = 9.$$

$$\left[6; \frac{1}{3}\right]$$

[indeterminata; impossibile]

[impossibile; -1]

$$[1; 0]$$

$$\left[40; \frac{3}{2}\right]$$

$$\left[100; \frac{1}{10}\right]$$

$$\left[128; \frac{1}{10}\right]$$

[80; impossibile]

$$\left[\frac{6}{17}\right]$$

$$[-16]$$

$$\left[\frac{2}{5}\right]$$

$$[4]$$

$$[-1]$$

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

$$\left[-\frac{1}{2}\right]$$

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

[impossibile]

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

$$\left[\frac{4}{3}\right]$$

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

$$[-2]$$

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

$$[-7]$$

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

$$\left[\frac{3}{2}\right]$$

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

[indeterminata]

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

$$[0]$$

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

$$\left[\frac{1}{8}\right]$$

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

$$\left[-\frac{3}{2}\right]$$

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

$$[-2]$$

$$2(x - 1)(1 + x) + (2 - x)^3 + 12x = 2(2x - 1)(1 + 2x) - x^3 + 8$$

[indeterminata]

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

$$[3]$$

$$\frac{x + 1}{3} - \frac{2(x - 1)}{5} + \frac{2}{3} = \frac{x - 4}{5} - \frac{4}{15}x$$

[impossibile]

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

$$\left[\frac{29}{4}\right]$$

$$\frac{1}{2}(1 + 2x) - x + \frac{2}{5}(x + 2) = \frac{3}{10}x - \frac{1}{2}$$

$$[-18]$$

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

$$[0]$$

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

$$[-3]$$

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

$$[1]$$

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

$$\left[\frac{1}{6}\right]$$

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

$$\left[\frac{1}{2}\right]$$

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

$$[3]$$

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

$$[6]$$

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

$$[4]$$

$$0,3x = \frac{2}{3}\left(x - \frac{1}{0,6}\right) + 1$$

$$[0]$$

Risolvi le seguenti equazioni utilizzando la legge di annullamento del prodotto.

$$(x - 3)(x + 6) = 0$$

$$[-6; 3]$$

$$2x^4 - 162 = 0$$

$$2x(x + 5) = 0$$

$$[-5; 0]$$

$$x - 5 = x^2 - 25$$

$$x(x^2 - 36) = 0$$

$$[0; \pm 6]$$

$$2a^3 - 4a^2 = 16a$$

$$x^3 - 9x = 0$$

$$[0; \pm 3]$$

$$3x^2 + 5x + 2 = 0$$

$$x^2 - 5x + 6 = 0$$

$$[2; 3]$$

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

$$3a^2 - a^3 = 0$$

$$[0; 3]$$

$$a(a^2 - 9) = a^2 + 3a$$

$$6x^3 - 24x = 0$$

$$[\pm 2; 0]$$

$$a^3 + 2a^2 - 5a - 6 = 0$$

$$[-3; -$$

Risolvi le seguenti equazioni numeriche fratte (nelle soluzioni sono omesse le condizioni di esistenza).

$2 + \frac{3}{x} = 0$	$[-\frac{3}{2}]$	$\frac{3}{x} + \frac{1}{2} = \frac{2x-1}{x}$	$[\frac{8}{3}]$
$\frac{9}{x-2} = 3$	$[5]$	$\frac{-1}{x-3} = \frac{2}{x+1}$	$[\frac{5}{3}]$
$\frac{x-1}{x+5} - 4 = 0$	$[-7]$	$\frac{x+1}{3x} = \frac{x}{3x+1}$	$[-\frac{1}{4}]$
$\frac{2x-8}{3x^2} = 0$	$[4]$	$\frac{1+3x}{4x+4} - \frac{5-x}{x+1} = 2$	$[-27]$
$\frac{3x-9}{2x-6} = 0$	[impossibile]	$\frac{5}{2-2x} - \frac{x}{x^2-2x+1} = 0$	$[\frac{5}{7}]$
$\frac{3(x-1)}{2x-2} = 1$	[impossibile]	$\frac{x+2}{2x} - \frac{4-x}{2x-x^2} = \frac{3x}{6x-12}$	[impossibile]
$\frac{1}{x} + \frac{1}{2} = 2$	$[\frac{2}{3}]$	$\frac{x-1}{x^2+3x} + \frac{2}{x} + \frac{9}{2x+6} = 0$	$[-\frac{2}{3}]$
$\frac{1}{4x} + 1 - \frac{1}{6x} = 0$	$[-\frac{1}{12}]$	$\frac{2x}{x-3} - \frac{5}{x} = \frac{6x}{3x-9} + \frac{2}{3x}$	[impossibile]
$\frac{2(x-1)}{x+2} = 1$	$[4]$	$\frac{3x}{x+2} + \frac{2x}{x-7} = \frac{5x+6}{x+2}$	$[-\frac{7}{2}]$
$\frac{2(x-4)}{x} = 0$	$[4]$	$\frac{2}{1-x} = \frac{1}{x-x^2} + \frac{1}{x}$	$[\frac{2}{3}]$
$\frac{3x-1}{3x} - \frac{x+2}{4x} = 0$	$[\frac{10}{9}]$	$\frac{4}{x^2-4} + \frac{1}{x^2-2x} = \frac{3}{x^2+2x}$	$[-4]$
$\frac{6}{x-5} + \frac{x}{5-x} = 1$	$[\frac{11}{2}]$	$\frac{x-1}{2x-6} + \frac{6}{x^2-9} - \frac{x}{2x+6} = 0$	$[-\frac{9}{5}]$
$\frac{1}{4-x} - \frac{2x}{x-4} = 0$	$[-\frac{1}{2}]$	$\frac{1}{2x-4} - \frac{2}{x+2} = \frac{x+5}{3x^2-12}$	$[\frac{20}{11}]$
$\frac{1}{2}(4 - \frac{1}{x}) - 6 = \frac{3}{x}$	$[-\frac{7}{8}]$	$\frac{2}{x^2-1} + \frac{7}{x-1} = \frac{1}{x+1}$	$[-\frac{5}{3}]$
$2[\frac{1}{3}(x-2) + \frac{5}{x}] = \frac{1+2x}{3}$	$[6]$	$\frac{6x+1}{x^2-4} - \frac{6}{x} = \frac{3}{x^3-4x}$	$[-21]$
$\frac{x^2}{x+4} - 2 = x$	$[-\frac{4}{3}]$	$\frac{4}{3x} + \frac{1}{3x+12} - \frac{x-1}{2x^2+8x} = 0$	$[-5]$
$\frac{1}{x-1} = \frac{2}{x-2}$	$[0]$	$\frac{x-1}{x^2+4x+4} + \frac{1}{2+x} = \frac{5}{4x+8}$	$[2]$
$\frac{3}{x+3} - \frac{2}{4-x} = 0$	$[\frac{6}{5}]$	$\frac{7x-10}{x^2+x-6} + \frac{6}{x-2} = \frac{5}{x+3}$	$[-\frac{9}{4}]$
$\frac{x^2}{x-3} - x - 1 = \frac{1}{2}$	$[-3]$	$\frac{2}{x^2-x} - \frac{4}{x^2-1} = \frac{1}{x^2+x}$	[impossibile]
$\frac{x}{2x+2} + x + 1 = \frac{x^2}{x+1}$	$[-\frac{2}{5}]$	$\frac{x+5}{2x-8} + \frac{x-2}{x} = \frac{3x+1}{2x} + \frac{x+1}{x(x-4)}$	$[-9]$
$x + \frac{4}{4-x} = \frac{x}{4-x} + x + 4$	[impossibile]	$\frac{x}{x+4} - \frac{3x+4}{2(x-3)} = -\frac{7+4x}{8+2x} + \frac{3}{2}$	$[-\frac{1}{30}]$
$\frac{x+1}{x-1} - 2 = \frac{2x}{x-1}$	[impossibile]	$\frac{x-1}{x+3} - \frac{2}{x^2+4x+3} = \frac{x+3}{x+1}$	$[-2]$
$\frac{2x-3}{2x+4} = \frac{x}{x+2} - \frac{1}{x}$	$[4]$	$\frac{2+2x^2}{x^3+1} + \frac{1-x^2}{x^2-x+1} + \frac{x}{x+1} = 0$	$[-\frac{3}{2}]$
$3 - \frac{1}{2x} = \frac{6+10x}{2x+4} - 2$	$[\frac{2}{13}]$	$(\frac{1}{3}x+1):(x+1) = \frac{2}{3} + \frac{1}{x}:(1+\frac{1}{x})$	$[-2]$

Risolvi le seguenti disequazioni numeriche intere.

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

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

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

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

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

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

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

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

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

$$4x - 3 < -\frac{2}{3}x + 3 \quad \left[x < \frac{9}{7} \right]$$

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

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

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

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

Risolvi i seguenti sistemi di disequazioni.

$$\begin{cases} x - 1 > 0 \\ x - 6 > 0 \end{cases} \quad [x > 6]$$

$$\begin{cases} 4x + 6 < 0 \\ 6x \geq 0 \end{cases} \quad [\text{impossibile}]$$

$$\begin{cases} x + 4 < 0 \\ 3x < 1 \end{cases} \quad [x < -4]$$

$$\begin{cases} x + 1 > 0 \\ -2x \geq 0 \\ 3x + 2 > 0 \end{cases} \quad \left[-\frac{2}{3} < x \leq 0\right]$$

$$\begin{cases} x - 4 < 0 \\ 2 - x > 0 \\ x + 3 > 0 \end{cases} \quad [-3 < x < 2]$$

$$\begin{cases} 3x + 9 + 2 < x - 1 \\ 2x - 3 > x + 7 \end{cases} \quad [\text{impossibile}]$$

$$\begin{cases} x - 6 - x(x - 1) > 2 - x^2 \\ 2x - 1 < 3 \end{cases} \quad [\text{impossibile}]$$

$$\begin{cases} x + 7 - 3x \geq -x(x + 1) + x^2 - 3 - 2x \\ 2x + 3 < 7 \end{cases} \quad [-10 \leq x < 2]$$

Risolvi le seguenti disequazioni.

$$(x-5)(x+2) > 0$$

$$[x < -2 \vee x > 5]$$

$$3x(2x-6) < 0$$

$$[0 < x < 3]$$

$$x(7x-2) \geq 0$$

$$\left[x \leq 0 \vee x \geq \frac{2}{7} \right]$$

$$2x\left(x + \frac{1}{2}\right)(x-2) > 0 \quad \left[-\frac{1}{2} < x < 0 \vee x > 2\right]$$

$$\frac{1}{x} < 0 \quad [x < 0]$$

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

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

$$\frac{1-x}{2x} \geq 0 \quad [0 < x \leq 1]$$

$$\frac{x+3}{1-2x} \leq 0 \quad [x \leq -3 \vee x > \frac{1}{2}]$$

$$\frac{3x-6}{2x+1} \geq 0 \quad [x < -\frac{1}{2} \vee x \geq 2]$$

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

$$\frac{x-3}{x} > 0 \quad [x < 0 \vee x > 3]$$

$$\frac{x}{x+1} \geq 0 \quad [x < -1 \vee x \geq 0]$$

$$\frac{1-x}{1+x} \leq 0 \quad [x < -1 \vee x \geq 1]$$

$$\frac{5-2x}{2+x} < 0 \quad [x < -2 \vee x > \frac{5}{2}]$$

$$\frac{3x-1}{2-5x} < 0 \quad [x < \frac{1}{3} \vee x > \frac{2}{5}]$$

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

$$\frac{1}{x} \leq 1 \quad [x < 0 \vee x \geq 1]$$

$$\frac{8}{3x} \leq -16 \quad [-\frac{1}{6} \leq x < 0]$$

$$\frac{3}{2x} \leq \frac{1-2x}{6x} \quad [-4 \leq x < 0]$$

$$\frac{7}{6} > \frac{4x+2}{x-7} \quad [-\frac{61}{17} < x < 7]$$

$$\frac{1}{5}x - \frac{1}{x-5} > \frac{x+1}{5} - \frac{x-1}{x-5} \quad [x < \frac{5}{4} \vee x > 5]$$

$$\frac{4}{x} < \frac{1}{2} \quad [x < 0 \vee x > 8]$$

$$\frac{10}{7x} > \frac{5}{14} \quad [0 < x < 4]$$

$$\frac{6x}{x-1} < 1 \quad [-\frac{1}{5} < x < 1]$$

$$\frac{x+1}{x-1} > \frac{3}{4} \quad [x < -7 \vee x > 1]$$

$$\frac{2}{x+4} \leq \frac{3}{2x+8} + \frac{1}{2} \quad [x < -4 \vee x \geq -3]$$

$$\frac{3x+2}{3} < \frac{2x^2-6}{2x+1} \quad [-\frac{20}{7} < x < -\frac{1}{2}]$$

$$1 - \frac{3}{x+2} < \frac{3x}{6+3x} \quad [x > -2]$$

$$\frac{x-3}{2x-1} + 1 \leq \frac{3}{2} \quad [x > \frac{1}{2}]$$

$$\frac{2}{3x} > \frac{4}{9} \quad [0 < x < \frac{3}{2}]$$

$$\frac{x-1}{x-2} \geq \frac{3}{4-2x} \quad [x \leq -\frac{1}{2} \vee x > 2]$$

$$\frac{3}{2} \cdot \frac{2x-1}{6-x} \geq \frac{3}{2(x-6)} \quad [0 \leq x < 6]$$

$$\frac{5x-1}{2x-4} - \frac{x-1}{3x-6} > 2 + \frac{1}{2-x} \quad [x < -29 \vee x > 2]$$

$$\frac{6+(3-x)^2}{x+2} - 1 \geq \frac{2-x^2}{-x-2} \quad [-2 < x \leq \frac{15}{7}]$$

$$x - \frac{1}{2-3x} > \frac{2x-1}{2} + \frac{6x+1}{3x-2} \quad [-\frac{2}{9} < x < \frac{2}{3}]$$