Esercizi su: Equazioni di primo grado.

1. Risolvi le seguenti equazioni.

(a) $-8x - 8 = x - 8$ $\hfill [0]$

(b) $-6x + 2 = 6x + 2$ $\hfill [0]$

(c) $-9x + 8 = -11x - 12$ $\hfill [-10]$

(d) $7x - 8 = -5x$ $\hfill [\frac{2}{3}]$

(e) $9x - 1 = -x + 8$ $\hfill [\frac{9}{10}]$

(f) $5x + 1 = 12x - 3$ $\hfill [\frac{4}{7}]$

(g) $9x - 11 = 11x$ $\hfill [-\frac{11}{2}]$

(h) $9x - 1 = -x - 3$ $\hfill [-\frac{1}{5}]$

(i) $-12x = 3x + 7$ $\hfill [-\frac{7}{15}]$

(j) $2x + 1 = 6x - 10$ $\hfill [\frac{11}{4}]$

(k) $10x - 5 = 4x + 10$ $\hfill [\frac{5}{2}]$

(l) $8x + 8 = 10x - 7$ $\hfill [\frac{15}{2}]$

(m) $-9x + 8 = 9x + 1$ $\hfill [\frac{7}{18}]$

(n) $-9x + 2 = -9x - 1$ $\hfill [eq.imposs.]$

(o) $-10x + 5 = x - 11$ $\hfill [\frac{16}{11}]$

(p) $2x + 12 = -x + 10$ $\hfill [-\frac{2}{3}]$

(q) $-7x + 9 = -7x - 12$ $\hfill [eq.imposs.]$

(r) $-10x - 9 = 9x - 11$ $\hfill [\frac{2}{19}]$

(s) $-9x + 12 = -6x + 5$ $\hfill [\frac{7}{3}]$

(t) $4x - 10 = -8x + 7$ $\hfill [\frac{17}{12}]$

(u) $-10x - 3 = 11x - 12$ $\hfill [\frac{3}{7}]$

(v) $12x + 8 = -3x + 1$ $\hfill [-\frac{7}{15}]$

(w) $-6x + 3 = 10x + 8$ $\hfill [-\frac{5}{16}]$

(x) $-10x + 8 = -3x - 9$ $\hfill [\frac{17}{7}]$

(y) $-3x + 6 = -9x - 4$ $\hfill [-\frac{5}{3}]$

(z) $-2x - 12 = 9x + 4$ $\hfill [-\frac{16}{11}]$

2. Risolvi le seguenti equazioni.

(a) $\frac{2x}{9} - 1 = \frac{12x}{5}$ $\hfill [-\frac{45}{98}]$

(b) $\frac{11x}{2} + \frac{6}{11} = 11x$ $\hfill [\frac{12}{121}]$

(c) $-2x - 1 = \frac{x}{2} - \frac{4}{7}$ $\hfill [-\frac{6}{35}]$

(d) $\frac{11x}{3} + 1 = -x + \frac{1}{5}$ $\hfill [-\frac{6}{35}]$

(e) $\frac{11x}{6} - \frac{1}{7} = -2x + 2$ $\hfill [\frac{90}{161}]$

(f) $\frac{x}{2} + 1 = \frac{x}{3} + \frac{7}{5}$ $\hfill [\frac{12}{5}]$

(g) $-\frac{5x}{6} + \frac{2}{3} = x + \frac{1}{4}$ $\hfill [\frac{5}{22}]$

(h) $x + \frac{1}{4} = -\frac{5x}{9} + \frac{3}{11}$ $\hfill [\frac{9}{616}]$

(i) $\frac{x}{4} + 12 = -\frac{x}{5} + \frac{11}{2}$ $\hfill [-\frac{130}{9}]$

(j) $\frac{x}{2} + 3 = -\frac{7x}{10} - \frac{1}{3}$ $\hfill [-\frac{25}{9}]$

(k) $\frac{7x}{8} = -\frac{2x}{11} - \frac{9}{5}$ $\qquad$ $[-\frac{264}{155}]$

(l) $\frac{3x}{10} + \frac{2}{11} = -5x + \frac{7}{12}$ $\qquad$ $[\frac{5}{66}]$

(m) $-\frac{6x}{5} - 6 = -\frac{11x}{3} - \frac{5}{7}$ $\qquad$ $[\frac{15}{7}]$

(n) $-\frac{10x}{7} + 2 = \frac{5x}{6} - \frac{7}{5}$ $\qquad$ $[\frac{714}{475}]$

(o) $-x + \frac{12}{11} = -\frac{6x}{11} - \frac{7}{3}$ $\qquad$ $[\frac{113}{15}]$

(p) $-3x - \frac{7}{5} = -\frac{4x}{3} + \frac{1}{2}$ $\qquad$ $[-\frac{57}{50}]$

(q) $-x + \frac{1}{3} = -\frac{11x}{8} - \frac{5}{7}$ $\qquad$ $[-\frac{176}{63}]$

(r) $-11x - \frac{8}{3} = -\frac{7x}{3} + \frac{9}{10}$ $\qquad$ $[-\frac{107}{260}]$

(s) $-\frac{7x}{4} - 4 = -\frac{10x}{11} + \frac{2}{5}$ $\qquad$ $[-\frac{968}{185}]$

(t) $-\frac{x}{3} - \frac{1}{12} = \frac{x}{6} + \frac{6}{11}$ $\qquad$ $[-\frac{83}{66}]$

(u) $\frac{x}{12} - \frac{4}{3} = \frac{8x}{7} + \frac{4}{7}$ $\qquad$ $[-\frac{160}{89}]$

(v) $\frac{7x}{6} + \frac{7}{12} = -\frac{x}{3} - \frac{1}{2}$ $\qquad$ $[-\frac{13}{18}]$

(w) $\frac{5x}{9} + \frac{2}{9} = -\frac{7x}{2} + \frac{4}{5}$ $\qquad$ $[\frac{52}{365}]$

(x) $\frac{8x}{5} - \frac{6}{5} = -\frac{5x}{12} - \frac{1}{3}$ $\qquad$ $[\frac{52}{121}]$

(y) $-\frac{5x}{3} + \frac{11}{9} = \frac{7x}{6} + \frac{5}{2}$ $\qquad$ $[-\frac{23}{51}]$

(z) $\frac{4x}{9} - \frac{3}{2} = \frac{3x}{5} - \frac{8}{11}$ $\qquad$ $[-\frac{765}{154}]$

3. Risolvi le seguenti equazioni.

(a) $16x^2 + 2x + 3 = -3x + (4x - 2)^2 - 1$ $\qquad$ $[0]$

(b) $-1 = -9x^2 - x + (-3x - 5)^2 - 4$ $\qquad$ $[-\frac{22}{29}]$

(c) $(x - 2)^2 + 4 = x + (x - 5)(x - 2) - 2$ $\qquad$ $[0]$

(d) $-4x + (x - 3)(x - 2) + 3 = -4x + (x - 2)^2 - 1$ $\qquad$ $[6]$

(e) $2x + (-x + 1)^2 + 3 = -5x + (-x - 1)(-x + 1) + 5$ $\qquad$ $[0]$

(f) $(-2x + 1)^2 - 5 = 4x + 4(x + 1)(x + 5)$ $\qquad$ $[-\frac{3}{4}]$

(g) $-2x + (x + 2)^2 - 3 = 5x + (x - 3)(x + 3) - 4$ $\qquad$ $[\frac{14}{3}]$

(h) $-3x + 9(x - 5)(x - 4) - (3x - 5)^2 - 1 = -5x$ $\qquad$ $[\frac{22}{7}]$

(i) $4x + (-3x - 4)(-3x + 4) - (-3x - 2)^2 - 4 = -5x + 3$ $\qquad$ $[-9]$

(j) $(x - 3)(x + 4) = x + (-x - 1)(-x + 1) + 2$ $\qquad$ $[eq.imposs.]$

(k) $3x + 2 = -x - (-2x - 1)^2 + 4(x - 2)(x - 1) + 1$ $\qquad$ $[\frac{3}{10}]$

(l) $3x + 5 = -x + 16(x - 3)(x + 5) - (4x - 3)^2 - 5$ $\qquad$ $[\frac{259}{52}]$

(m) $-3x + 25(x - 1)(x + 3) + 3 = -3x + (5x - 1)^2 - 3$ $\qquad$ $[\frac{7}{6}]$

(n) $4x + (-x - 2)(-x + 2) + 2 = 5x + (-x - 5)^2 + 2$ $\qquad$ $[-\frac{29}{11}]$

(o) $5x + (3x - 3)(3x + 3) - (3x + 4)^2 + 1 = -3x - 3$ $\qquad$ $[-\frac{21}{16}]$

(p) $-2x + (-3x - 2)^2 = 5x + (-3x - 4)(-3x + 4) + 3$ $\qquad$ $[-\frac{17}{5}]$

(q) $-x + (-5x - 5)(-5x + 5) + 3 = 5x + (-5x + 3)^2 - 2$ $\qquad$ $[\frac{29}{24}]$

(r) $-4x + 4 = -3x - (-3x - 5)^2 + 9(x - 5)(x + 1) - 5$ $\qquad$ $[-\frac{79}{65}]$

(s) $4x + 5 = 5x + (-4x - 3)^2 - (-4x - 1)(-4x + 1) + 1$ $\qquad$ $[-\frac{6}{25}]$

(t) $-4x + (-5x - 3)(-5x + 3) - (-5x + 4)^2 + 2 = 5x + 5$ $\qquad$ $[\frac{28}{31}]$

(u) $2x + 9(x + 1)(x + 3) = -x + (3x - 5)(3x + 5) - 2$ $\qquad$ $[-\frac{18}{13}]$

(v) $-3x + 4(x - 5)(x - 4) - (2x - 1)(2x + 1) + 3 = x + 2$ $\qquad$ $[\frac{41}{20}]$

(w) $(-3x-4)(-3x+4)+5 = -3x+9(x-4)(x+2)+1$ $\qquad$ $[-\frac{20}{7}]$

(x) $-x-4 = -4x+(-2x-4)(-2x+4)-4(x-5)(x+5)$ $\qquad$ $[\frac{88}{3}]$

(y) $-4x+(2x-1)(2x+1)+2 = -3x+4(x-4)(x+1)+3$ $\qquad$ $[-\frac{14}{11}]$

(z) $3x+(-4x-3)(-4x+3)-16(x+1)(x+3)-1 = -5x+2$ $\qquad$ $[-\frac{15}{14}]$

4. Risolvi le seguenti equazioni.

(a) $2x-\frac{4}{3} = -\frac{3x}{2}-\frac{4}{3}$ $\qquad$ $[0]$

(b) $-\frac{4x}{3}+\frac{1}{2} = 3x+3$ $\qquad$ $[-\frac{15}{26}]$

(c) $-x^2+(x-5)(x+5)+\frac{5}{2} = -\frac{5x}{4}-\frac{4}{3}$ $\qquad$ $[\frac{254}{15}]$

(d) $5 = -\frac{4x^2}{25}-5x+\frac{4\left(x-\frac{3}{2}\right)(x-1)}{25}$ $\qquad$ $[-\frac{119}{135}]$

(e) $\frac{16x^2}{9}-\frac{16x(x+1)}{9}-\frac{5x}{4}+\frac{5}{2} = -\frac{5}{2}$ $\qquad$ $[\frac{180}{109}]$

(f) $\frac{3x}{2}+(x-5)\left(x-\frac{2}{5}\right)-1 = -x+(-x-5)^2-4$ $\qquad$ $[-\frac{200}{129}]$

(g) $16x\left(x-\frac{3}{2}\right)+5x-\left(4x-\frac{4}{5}\right)\left(4x+\frac{4}{5}\right)-3 = -\frac{4x}{5}+1$ $\qquad$ $[-\frac{12}{65}]$

(h) $\frac{4x}{5} = -\frac{4x}{5}+\left(x-\frac{3}{2}\right)\left(x+\frac{3}{2}\right)-\left(x+\frac{4}{5}\right)^2+2$ $\qquad$ $[-\frac{89}{320}]$

(i) $x+\left(-\frac{2x}{3}+\frac{5}{2}\right)^2+2 = 2x+\frac{4(x-4)\left(x+\frac{5}{2}\right)}{9}-\frac{3}{2}$ $\qquad$ $[\frac{511}{132}]$

(j) $2x+\frac{1}{3} = \frac{4x}{3}+\left(-\frac{5x}{4}-2\right)^2-\frac{25(x-2)\left(x-\frac{1}{4}\right)}{16}-3$ $\qquad$ $[\frac{2}{137}]$

(k) $-\frac{3x}{5}+1 = \left(-2x-\frac{4}{3}\right)\left(-2x+\frac{4}{3}\right)-4\left(x+\frac{2}{3}\right)^2+\frac{1}{3}$ $\qquad$ $[-\frac{190}{213}]$

(l) $\frac{3x}{4}+\left(-2x-\frac{2}{3}\right)\left(-2x+\frac{2}{3}\right)+1 = x+\left(-2x+\frac{1}{4}\right)^2+\frac{4}{5}$ $\qquad$ $[\frac{221}{540}]$

(m) $\frac{3x}{4}-\frac{4}{3} = \left(\frac{x}{4}-\frac{2}{5}\right)^2-\frac{(x-4)\left(x-\frac{2}{5}\right)}{16}+\frac{2}{3}$ $\qquad$ $[\frac{412}{135}]$

(n) $-\frac{5x}{2}+16(x-1)(x+2)+\frac{1}{2} = \frac{3x}{4}+(-4x-3)(-4x+3)-\frac{5}{2}$ $\qquad$ $[\frac{80}{51}]$

(o) $\frac{4x}{3}+\left(-\frac{3x}{4}-\frac{3}{5}\right)^2 = \frac{9\left(x-\frac{4}{5}\right)\left(x-\frac{3}{5}\right)}{16}+\frac{3}{5}$ $\qquad$ $[\frac{612}{3625}]$

(p) $-2x+\left(-2x+\frac{5}{4}\right)^2-\frac{4}{3} = -\frac{5x}{3}+4\left(x-\frac{5}{2}\right)\left(x+\frac{5}{4}\right)-\frac{5}{3}$ $\qquad$ $[\frac{691}{16}]$

(q) $4x-\frac{1}{3} = x+\left(-\frac{3x}{4}-\frac{3}{4}\right)^2-\frac{9\left(x-\frac{5}{2}\right)\left(x-\frac{3}{4}\right)}{16}-\frac{1}{2}$ $\qquad$ $[-\frac{253}{18}]$

(r) $x+\frac{25\left(x-\frac{5}{2}\right)(x-1)}{4}-\frac{3}{5} = \left(-\frac{5x}{2}-2\right)\left(-\frac{5x}{2}+2\right)+\frac{3}{5}$ $\qquad$ $[\frac{737}{835}]$

(s) $-\frac{25x^2}{4}+\frac{x}{5}+\left(\frac{5x}{2}-\frac{5}{2}\right)\left(\frac{5x}{2}+\frac{5}{2}\right)+\frac{1}{5} = \frac{2x}{5}-\frac{3}{5}$ $\qquad$ $[-\frac{109}{4}]$

(t) $\frac{2x}{3}+\frac{9\left(x-\frac{3}{5}\right)\left(x+\frac{1}{2}\right)}{4}-\frac{3}{5} = x+\left(-\frac{3x}{2}+\frac{1}{2}\right)^2-\frac{2}{3}$ $\qquad$ $[\frac{103}{113}]$

(u) $\frac{x}{3}-\left(-\frac{3x}{5}-5\right)\left(-\frac{3x}{5}+5\right)+\frac{9(x-5)(x+4)}{25}-4 = -\frac{5x}{3}+\frac{4}{5}$ $\qquad$ $[-\frac{325}{41}]$

(v) $-\frac{5x}{2}-\frac{4}{5} = -\frac{25x^2}{4}-\frac{5x}{4}+\left(-\frac{5x}{2}-\frac{1}{2}\right)\left(-\frac{5x}{2}+\frac{1}{2}\right)+\frac{3}{5}$ $\qquad$ $[-\frac{23}{25}]$

(w) $2x-\left(\frac{x}{4}-\frac{3}{2}\right)\left(\frac{x}{4}+\frac{3}{2}\right)+\frac{\left(x-\frac{5}{2}\right)(x+5)}{16}+\frac{2}{3} = x+\frac{3}{4}$ $\qquad$ $[-\frac{133}{111}]$

(x) $-\frac{x}{5}-\frac{2}{3} = x-\left(\frac{4x}{5}-\frac{4}{5}\right)\left(\frac{4x}{5}+\frac{4}{5}\right)+\frac{16(x-4)\left(x-\frac{4}{3}\right)}{25}+\frac{3}{2}$ $\qquad$ $[\frac{933}{332}]$

(y) $-5x+\frac{25\left(x-\frac{1}{5}\right)\left(x+\frac{3}{4}\right)}{16}-1 = -\frac{2x}{5}+\left(\frac{5x}{4}-\frac{3}{5}\right)\left(\frac{5x}{4}+\frac{3}{5}\right)+\frac{2}{5}$ $\qquad$ $[-\frac{2039}{5985}]$

(z) $-\frac{2x}{5}+\left(\frac{5x}{4}-\frac{1}{5}\right)\left(\frac{5x}{4}+\frac{1}{5}\right)+\frac{1}{2} = 2x+\frac{25\left(x+\frac{3}{4}\right)\left(x+\frac{5}{4}\right)}{16}-\frac{2}{5}$ $\qquad$ $[-\frac{3871}{35360}]$

5. Risolvi le seguenti equazioni.

(a) $-\frac{7x}{5} = -\frac{8x}{9}+\frac{1}{2}$ $\qquad$ $[-\frac{45}{46}]$

(b) $10x+11 = x+2$ $\qquad$ $[-1]$

(c) $2x + (5x+1)^2 - 1 = x + 25(x-5)(x+1) - 4$ $\qquad$ $[-\frac{43}{37}]$

(d) $x + 4 = -4x + 3$ $\qquad$ $[-\frac{1}{5}]$

(e) $-x + \left(-4x - \frac{4}{3}\right)\left(-4x + \frac{4}{3}\right) - 16\left(x - \frac{5}{2}\right)\left(x + \frac{3}{2}\right) - \frac{3}{2} = x + \frac{5}{3}$ $\qquad$ $[-\frac{991}{252}]$

(f) $-\frac{2x}{7} - \frac{5}{2} = \frac{x}{2} - 4$ $\qquad$ $[\frac{21}{11}]$

(g) $x + 1 = -10x + 10$ $\qquad$ $[\frac{9}{11}]$

(h) $2x - \frac{11}{12} = x$ $\qquad$ $[\frac{11}{12}]$

(i) $-12x - 12 = -10x + 7$ $\qquad$ $[-\frac{19}{2}]$

(j) $2x + \left(\frac{4x}{3} - 2\right)\left(\frac{4x}{3} + 2\right) - 4 = -x + \left(\frac{4x}{3} - \frac{3}{5}\right)^2 - \frac{3}{2}$ $\qquad$ $[\frac{343}{230}]$

(k) $-12x - 11 = 9x - 3$ $\qquad$ $[-\frac{8}{21}]$

(l) $5x - 2 = -3x + 7$ $\qquad$ $[\frac{9}{8}]$

(m) $5x + (x-2)(x+2) + 3 = -x + (x-2)(x+1) + 4$ $\qquad$ $[\frac{3}{7}]$

(n) $-4x + (-4x-5)(-4x+5) - 2 = 5x + 16(x-3)(x-1) + 5$ $\qquad$ $[\frac{16}{11}]$

(o) $-x - \frac{10}{7} = -\frac{x}{2} + 1$ $\qquad$ $[-\frac{34}{7}]$

(p) $-\frac{4x}{3} + \left(-\frac{x}{3} - 4\right)^2 - \frac{(x-4)\left(x+\frac{1}{3}\right)}{9} + 1 = -x + \frac{1}{4}$ $\qquad$ $[-\frac{1825}{296}]$

(q) $\frac{2}{3} = -\frac{33}{4}$ $\qquad$ $[eq.imposs.]$

(r) $\frac{4x}{3} + \frac{3}{4} = \frac{4x}{3} - \frac{3}{2}$ $\qquad$ $[eq.imposs.]$

(s) $-5x - 1 = -10x - 11$ $\qquad$ $[-2]$

(t) $6x + 9 = -3x + 1$ $\qquad$ $[-\frac{8}{9}]$

(u) $9(x-5)(x-2) - 4 = 5x + (3x-5)^2 - 1$ $\qquad$ $[\frac{31}{19}]$

(v) $-\frac{4x}{3} + (x-3)(x+3) - (x+1)^2 - \frac{3}{5} = 2$ $\qquad$ $[-\frac{189}{50}]$

(w) $3x + \frac{25\left(x - \frac{3}{4}\right)\left(x - \frac{1}{2}\right)}{4} - \frac{3}{5} = 4x + \left(\frac{5x}{2} - 1\right)\left(\frac{5x}{2} + 1\right) - 1$ $\qquad$ $[\frac{599}{1410}]$

(x) $3x - 2 = 5x - 7$ $\qquad$ $[\frac{5}{2}]$

(y) $\frac{x}{5} + \left(\frac{x}{4} + 2\right)^2 + \frac{3}{4} = \frac{5x}{4} + \left(\frac{x}{4} - \frac{1}{5}\right)\left(\frac{x}{4} + \frac{1}{5}\right) - \frac{2}{3}$ $\qquad$ $[\frac{1637}{15}]$

(z) $\frac{5x}{2} + \frac{10}{3} = -x - \frac{8}{11}$ $\qquad$ $[-\frac{268}{231}]$