Urednik
ZLATKO ŠPORER

Stručni recenzenti
IGNACIJE SMOLEC
MILKA MUŽNY-ČENGIĆ

Omot opremio
IVAN FANUKO

Crteže izradili
inž. NIKOLA ČUBRANIĆ
LJILJANA METZGER

7065:7
5425

500000 : 7065 = 70,7
7010

500000 : 7065 = 70,7
57500

TISAK GRAFIČKI ZAVOD HRVATSKE — ZAGREB

A L G E B R A

1. LINEARNE JEDNADŽBE S JEDNOM NEPOZNANICOM

1. a) $8x - 2 = 7x$
b) $-1 - 3x = -4x$
c) $7x - 9 = 6x$
d) $-10 + 5x = 4x$
e) $7x + 4 = 8x$

2. a) $8x - 5 = 7x + 3$
b) $4 + 2x = x + 5$
c) $-5 + 7x = 6x + 2$
d) $4 - 3x = 7 - 4x$
e) $3x + 3 = 6 + 2x$

3. a) $3x = 24$
b) $-5x = 15$
c) $2x = -8$
d) $-4x = -12$
e) $2x = 3$

4. a) $5(x - 5) = 35 - 10x$
b) $16 - 2x = 2(13 - 2x)$
c) $9(x - 5) = -18x + 63$
d) $5 + 4x = 7\left(x - \frac{4}{7}\right)$
e) $3(x + 3) = 2x + 15$

5. a) $2x - 8 + 5x = 10x - 2$
b) $2 + 2(x + 5) = 8x + 18$
c) $3x - 55 + 4x = 2x - 75$
d) $9 - 2x + 9 = 7(x + 9)$
e) $4x + 3x + 34 = 106 + 19x$

6. a) $2x - 15 = -3(x + 11) + 4x$
b) $21 - 8x = 23 + 2(x + 14)$
c) $2(11x - 3) = 4x - 50 + 7x$
d) $-15 + 4x = -5(1 - x) + 14$
e) $12 + 5x = 3(x + 6) + 4x$

7. a) $28x - 4 - (23x + 21) = 4(x + 4) + 4x - 59$
b) $-(3x + 18) + 10x + 6 = -(9x - 16) - (38 - 14x)$
c) $(-4x + 16) - (-6x + 35) - 4(2x - 3) + (3x - 17) = 0$
d) $-4(3 - x) - (5 + x) = (-8 - 3x) + 3 + 10x$
e) $(25 - 3x) - (39 - 9x) + 3(9 + x) - 2(10 + 4x) = 0$

8. a) $37x - (8 + 13x + 33x + 4) = 25 - (-13x + 47)$

b) $-69 - (12x - 14 - 26x - 42) = 4x + (4x + 5)$

c) $2(9x - 8) - (-5x + 12 + 6x - 15) = 7x - (-8x + 7)$

d) $-(5x - 2 - 9x) - (5x - 13) = 5 - (2 - 3x) - 8x$

e) $104x - (97x - 4 + 5x) = -12 - (-20 - 3x)$

9. a) $\frac{x}{3} = 2$

b) $\frac{4x}{-5} = 12$

c) $\frac{-3x}{2} = 6$

d) $-\frac{3x}{4} = -9$

e) $\frac{5x}{2} = -15$

10. a) $4 - x = \frac{4x}{3} + 11$

b) $\frac{x}{5} - \frac{4}{3} = -\left(\frac{4}{5} - \frac{x}{3}\right)$

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

d) $\frac{2x}{3} - 3 = -\left(-\frac{7x}{9} + 2\right)$

e) $\frac{x}{5} - 1\frac{1}{2} = -\frac{1}{4}\left(7 - \frac{3x}{5}\right)$

11. a) $\frac{x}{3} - \frac{x}{4} = x - 5\frac{1}{2}$

b) $\frac{x}{3} - \frac{2}{3} = \frac{2x}{5} - 1$

c) $-\left(\frac{x}{5} - \frac{x}{2}\right) - x + 7 = 0$

d) $2\left(\frac{x}{3} + 6\right) - \frac{5}{6}x = 11$

e) $\frac{1}{4}(3x - 8) - 4\left(\frac{5x}{16} - 1\right) = 0$

12. a) $\frac{1}{3}(2x - 27) = \frac{4x}{9} - 7$

b) $x - 1\frac{1}{2} = \frac{x}{2} - 3\frac{1}{2}$

c) $\frac{x}{2} - \frac{2x}{3} - 5\left(1 - \frac{x}{5}\right) = 0$

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

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

13. a) $\frac{x}{2} - \frac{x}{3} = -\frac{1}{6}\left(-\frac{x}{2} - 2\right)$

b) $-\frac{1}{4}\left(-\frac{x}{2} - 12\right) = 2\left(\frac{x}{12} + 1\right)$

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

d) $\frac{x}{2} - \frac{2}{3}x - \frac{1}{18}(7x - 100) = 0$

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

14. a) $4\left(\frac{x}{12} - \frac{x}{16}\right) = x - 5\frac{1}{2}$

b) $\frac{x}{2} - \frac{1}{3} = 3\left(\frac{x}{4} + \frac{1}{18}\right)$

c) $\frac{1}{2}\left(\frac{9x}{7} - 1\right) = 2\left(x + \frac{3}{7}\right)$

d) $\frac{1}{2}(2x + 11) = -\left(\frac{3}{7} + \frac{5x}{7}\right)$

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

15. a) $\frac{2}{7}(x - 22) + \frac{4}{7}x = \frac{5}{7}x$

b) $\frac{1}{4}\left(5x + 3\frac{1}{2}x\right) - 1\frac{1}{4}x + 3\frac{1}{2} = 0$

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

d) $-\left(\frac{2x}{3} - \frac{x}{5}\right) = 1\frac{3}{4}x + 33\frac{1}{4}$

e) $2\left(\frac{x}{4} - \frac{2x}{9}\right) = -\frac{1}{3}(2x + 39)$

16. a) $\frac{1}{2} = 0{,}5\,(x - 3)$

b) $\frac{6}{25} = 3\,(0{,}01x + 0{,}05)$

c) $-\frac{2}{25} = \frac{1}{20}x - 0{,}23$

24. a) $4x - \{3x - [6x - (9x + 5)]\} = 9 - \{4x - [3x - (8 - 9x)]\}$

b) $17(3x - 1) - \{[11(5x - 2) - 13(2x + 1)] + (19x + 27)\} = 0$

c) $3(x - 6) - \{[5(x + 3) - 19(x - 9)] + [5(x - 12) - 4(12 - x)]\} = 0$

d) $-\{[4(3x - 5) + 2(9x + 1)] - 6(3x + 5)\} - [3(x - 4) + 8(x - 6)] = 16$

e) $4(2x - 7) = -\{[32 - 6(x + 2)] + [7(2x - 3) - 3(5x - 8)]\}$

25. a) $\frac{3x + 5}{2} - 6\frac{1}{6} = \frac{3x - 5}{3}$

b) $-\frac{2x - 7}{3} + \frac{5x - 8}{4} = 3\frac{1}{4}$

c) $\frac{3x - 2}{5} - \frac{2x - 8}{3} - 1\frac{13}{15} = 0$

d) $-\frac{3x + 4}{8} = 1\frac{3}{4} - \frac{7x - 5}{3}$

e) $9\frac{3}{10} - \frac{4x - 5}{2} = -\frac{2x - 3}{5}$

f) $-\frac{3x - 2}{5} + \frac{2x + 7}{4} - 2\frac{1}{20} = 0$

26. a) $\frac{5x - 8}{4} - \left(\frac{2x + 3}{3} - 1\frac{1}{4}\right) = 0$

b) $10\frac{1}{10} = -\left(\frac{2x - 11}{5} - \frac{x + 14}{2}\right)$

c) $6\frac{2}{3} - \left(\frac{5x - 4}{2} - \frac{3x + 1}{3}\right) = 0$

d) $-\left(2\frac{1}{12} - \frac{7x - 12}{3}\right) = \frac{2x + 5}{4}$

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

f) $\frac{3x + 1}{4} - \left(8 + \frac{5x - 4}{3}\right) = -11$

27. a) $\frac{2x + 3}{3} - \left[\frac{3x - 3}{5} - \left(\frac{x - 6}{2} - \frac{2x - 12}{5}\right)\right] = 2$

b) $\frac{2x - 5}{11} - \left[\frac{3x - 4}{11} - \left(2 - \frac{x + 8}{4}\right)\right] = -\left[(9 - x) + \frac{2x + 4}{11}\right]$

c) $\frac{3x - 15}{6} + 2 - \left[\frac{2x - 6}{3} + \left(3 - \frac{x - 9}{7}\right)\right] = -3$

d) $\frac{5x - 3}{4} - \left[2 - \left(\frac{5x - 4}{2} - \frac{6x - 4}{7}\right)\right] = 4\frac{1}{2}$

e) $\frac{2x - 5}{2} - \left[\left(\frac{x + 14}{8} + 5\right) - \left(3 + \frac{3x - 7}{2}\right)\right] = \frac{2x + 3}{2}$

28. a) $\frac{3x + 5}{2} - \left\{\left(2 + \frac{4x - 5}{3}\right) - \left[\frac{2x}{3} - (x - 1)\right] - \left(\frac{x}{3} - 4\right)\right\} = 0$

b) $-\left\{\left(\frac{3x - 7}{2} - \frac{4x - 9}{5}\right) + \left[2 - \left(6 - \frac{5x - 9}{3}\right)\right]\right\} = -\frac{x + 5}{2}$

c) $\frac{6x + 5}{10} - \left\{\left[\frac{1 - 11x}{18} - \left(8\frac{1}{2} - 3x\right)\right] + \frac{x - 5}{3}\right\} = \frac{5 - x}{3}$

d) $\frac{7x - 5}{11} - \left\{\left(\frac{4x}{11} - 4\frac{6}{11}\right) + \left[3\frac{1}{2} + \left(x - \frac{3x}{2}\right)\right]\right\} = -11$

e) $-\left\{\left[\left(\frac{2x}{5} + 7\right) + \left(-\frac{2x - 5}{5} - \frac{3x + 1}{2}\right)\right] - \frac{3x}{4}\right\} = \frac{x + 10}{4}$

29. a) $(x + 10) : x = 3 : 1$
b) $2x : (5x - 2) = 1 : 2$
c) $(7x - 3) : 6x = 2 : 3$
d) $2x : (x - 2) = 4 : 1$
e) $(x + 6) : x = 2 : 1$
f) $3x : (2x + 9) = 3 : 5$

30. a) $(2x + 7) : (3x - 7) = 3 : 2$
b) $(5x - 12) : (4x - 11) = 4 : 3$
c) $(2x - 3) : (3x - 7) = 3 : 4$
d) $(4x - 5) : (3x - 5) = 7 : 5$
e) $(2x + 1) : 2 = (7x + 5) : 8$
f) $4 : (x - 1) = 11 : (3x - 4)$

24. a) $4x - \{3x - [6x - (9x + 5)]\} = 9 - \{4x - [3x - (8 - 9x)]\}$

b) $17(3x - 1) - \{[11(5x - 2) - 13(2x + 1)] + (19x + 27)\} = 0$

c) $3(x - 6) - \{[5(x + 3) - 19(x - 9)] + [5(x - 12) - 4(12 - x)]\} = 0$

d) $-\{[4(3x - 5) + 2(9x + 1)] - 6(3x + 5)\} - [3(x - 4) + 8(x - 6)] = 16$

e) $4(2x - 7) = -\{[32 - 6(x + 2)] + [7(2x - 3) - 3(5x - 8)]\}$

25. a) $\frac{3x + 5}{2} - 6\frac{1}{6} = \frac{3x - 5}{3}$

b) $-\frac{2x - 7}{3} + \frac{5x - 8}{4} = 3\frac{1}{4}$

c) $\frac{3x - 2}{5} - \frac{2x - 8}{3} - 1\frac{13}{15} = 0$

d) $-\frac{3x + 4}{8} = 1\frac{3}{4} - \frac{7x - 5}{3}$

e) $9\frac{3}{10} - \frac{4x - 5}{2} = -\frac{2x - 3}{5}$

f) $-\frac{3x - 2}{5} + \frac{2x + 7}{4} - 2\frac{1}{20} = 0$

26. a) $\frac{5x - 8}{4} - \left(\frac{2x + 3}{3} - 1\frac{1}{4}\right) = 0$

b) $10\frac{1}{10} = -\left(\frac{2x - 11}{5} - \frac{x + 14}{2}\right)$

c) $6\frac{2}{3} - \left(\frac{5x - 4}{2} - \frac{3x + 1}{3}\right) = 0$

d) $-\left(2\frac{1}{12} - \frac{7x - 12}{3}\right) = \frac{2x + 5}{4}$

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

f) $\frac{3x + 1}{4} - \left(8 + \frac{5x - 4}{3}\right) = -11$

27. a) $\frac{2x + 3}{3} - \left[\frac{3x - 3}{5} - \left(\frac{x - 6}{2} - \frac{2x - 12}{5}\right)\right] = 2$

b) $\frac{2x - 5}{11} - \left[\frac{3x - 4}{11} - \left(2 - \frac{x + 8}{4}\right)\right] =$

$= -\left[(9 - x) + \frac{2x + 4}{11}\right]$

c) $\frac{3x - 15}{6} + 2 - \left[\frac{2x - 6}{3} + \left(3 - \frac{x - 9}{7}\right)\right] = -3$

d) $\frac{5x - 3}{4} - \left[2 - \left(\frac{5x - 4}{2} - \frac{6x - 4}{7}\right)\right] = 4\frac{1}{2}$

e) $\frac{2x - 5}{2} - \left[\left(\frac{x + 14}{8} + 5\right) - \left(3 + \frac{3x - 7}{2}\right)\right] = \frac{2x + 3}{2}$

28. a) $\frac{3x + 5}{2} - \left\{\left(2 + \frac{4x - 5}{3}\right) - \left[\frac{2x}{3} - (x - 1)\right] - \left(\frac{x}{3} - 4\right)\right\} = 0$

b) $-\left\{\left(\frac{3x - 7}{2} - \frac{4x - 9}{5}\right) + \left[2 - \left(6 - \frac{5x - 9}{3}\right)\right]\right\} = -\frac{x + 5}{2}$

c) $\frac{6x + 5}{10} - \left\{\left[\frac{1 - 11x}{18} - \left(8\frac{1}{2} - 3x\right)\right] + \frac{x - 5}{3}\right\} = \frac{5 - x}{3}$

d) $\frac{7x - 5}{11} - \left\{\left(\frac{4x}{11} - 4\frac{6}{11}\right) + \left[3\frac{1}{2} + \left(x - \frac{3x}{2}\right)\right]\right\} = -11$

e) $-\left\{\left[\left(\frac{2x}{5} + 7\right) + \left(-\frac{2x - 5}{5} - \frac{3x + 1}{2}\right)\right] - \frac{3x}{4}\right\} = \frac{x + 10}{4}$

29. a) $(x + 10) : x = 3 : 1$
b) $2x : (5x - 2) = 1 : 2$
c) $(7x - 3) : 6x = 2 : 3$
d) $2x : (x - 2) = 4 : 1$
e) $(x + 6) : x = 2 : 1$
f) $3x : (2x + 9) = 3 : 5$

30. a) $(2x + 7) : (3x - 7) = 3 : 2$
b) $(5x - 12) : (4x - 11) = 4 : 3$
c) $(2x - 3) : (3x - 7) = 3 : 4$
d) $(4x - 5) : (3x - 5) = 7 : 5$
e) $(2x + 1) : 2 = (7x + 5) : 8$
f) $4 : (x - 1) = 11 : (3x - 4)$

31. a) $[5x - (2x - 3)] : [3x + (8 - x)] = 3 : 4$

b) $[3(x + 2) - 7x] : [4x - 2(x - 2)] = 19 : 15$

c) $[5{,}6x - (3{,}4x - 3)] : [3{,}2x + 8(2 - 0{,}3x)] = 7 : 10$

d) $[4{,}3x - 2(2{,}5x - 3)] : \left[7{,}2x - 3\left(1{,}5x - \frac{3{,}7}{3}\right)\right] = 1 : 2$

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

f) $\left[\frac{3}{5}x + \left(1 - \frac{3}{7}x\right)\right] : \left[\left(3 - \frac{3}{5}x\right) - \frac{3}{4}x\right] = 26 : 49$

32. a) $(x + 1)(x - 2) = (x + 3)(x - 3)$

b) $(x + 4)(2x - 11) = 2(x - 2)(x - 3)$

c) $(2x - 5)(x + 1) - 2(x + 4)(x - 4) = 0$

d) $(x - 7)(x + 5) - (x - 1)(x - 5) = 0$

e) $(3x - 5)(2x + 5) = 6x(x - 3) - 15\frac{4}{5}$

f) $(3x - 4)(3x + 4) - (3x - 7)(3x + 2) = 0$

33. a) $(7x + 3) : (7x - 4) = 5(x + 1) : (5x - 2)$

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

c) $(3x + 5) : 2x = (9x - 13) : 6(x - 2)$

d) $(5x - 3) : (2x - 1) = (10x - 23) : (4x - 9)$

e) $(2x - 3) : (x - 3)\,2 = (3x + 20) : (3x + 5)$

f) $(3x - 14) : (6x - 17) = 2(x - 4) : (4x - 5)$

34. a) $(x - 2)^2 + (x - 3)^2 = (x - 5)^2 - [4 - (4 - x)^2]$

b) $(x - 3)^2 - (x + 7)^2 = -2\{[4(x - 1) + 9x] + 9\}$

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

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

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

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

35. a) $(x - 4)^2 - \{(x - 5)^2 + [(2x - 3) - (x + 1)] - 5(4 - x)\} =$
$= x - 15$

b) $(6 - x)^2 - (5 - x)^2 = -3[(x - 5) + 1]$

c) $(x - 2)^2 - \{(x + 3)^2 + [4(x - 6) - 8]\} = -5(2x - 3)$

d) $2(17x - 1) - \{[(x + 14)^2 + 4] - (1 - x)\} = -(x - 12)^2$

e) $(x - 30)^2 - \{(x - 4) - [(2x - 14) - (x + 11)]\} =$
$= (x - 20)^2 - 21$

f) $(x + 3)^2 - \{[(5x + 4)^2 - 6(2x - 1)^2] + [8 - 7(2x - 5)]\} = 0$

36. a) $(x - 5)^2 - \{[(x + 5) - (x + 9)^2] - 12\} = 2(x^2 + 12x - 3)$

b) $(x - 13)^2 - [(x + 3)^2 - (2x - 17)^2] = -[232 - (2x - 21)^2]$

c) $[2(2x + 1)]^2 - \{(5x + 7)^2 - [(3x + 8)^2 - 19]\} = 0$

d) $[5(2x - 3)]^2 - \{[4(2x - 3)]^2 + [2(3x - 5)]^2\} = 5$

e) $(4 - x)^2 + \{(5 + x)^2 - [(5 - 2x)^2 + 236 - 2x^2]\} = 0$

f) $(x - 7)^2 = \{(x - 15)^2 - [x^2 - (x - 10)^2]\} + 444$

37. a) $(x - 3)^2 - [(2x + 5)^2 - (3x - 1)(x + 2)] = 45$

b) $-\{(x - 3)^2 + [(x + 3)(x - 3) + 12] - x^2\} + (x - 2)^2 = 0$

c) $(2 - x)^2 - \{[(4 + x)^2 + (3x + 4)(x - 2) - 3x^2] + 16\} = 0$

d) $\{[(x - 9)^2 - (2x - 3)(x + 8)] + 445\} - (x - 5)^2 = -2x^2$

e) $(6x - 5)^2 - [(4x - 3)(9x - 8) - (5 - x)] = 4$

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

38. a) $(6x - 1)^2 + \{(8x - 3)^2 - [(10x - 7)^2 + 41]\} = 0$

b) $(x - 1)^2 + \{x^2 - [2(x + 1)^2 + 5]\} = (x + 1)\,4$

c) $\{(3x + 4)^2 + [40x(x - 1) - 9]\} - (7x - 1)^2 = 0$

d) $(2x - 7)^2 - [(x - 5)^2 + 3x(x - 2)] = 2(x - 2)$

e) $27 = (3x + 1)^2 - [(2x - 5)^2 + 5x(x - 5)]$

f) $5 - [(9 - 2x)^2 + (23 - 3x^2)] + (8 - x)^2 = (x - 2)\,3 + 5$

39. a) $(9 - 2x)^2 - \{(7 - 3x)^2 + [5x(1 - x) + 35]\} = 0$

b) $(2x - 3)^2 - [(x + 5)^2 + 3(x - 1)^2] = 13$

c) $-\{(7x - 2)^2 + [-6(2x - 1)^2 - 9]\} = -(5x - 1)^2$

d) $(x + 5)^2 - [2(x - 9)^2 - 24] = -(x - 7)^2$

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

f) $(3x + 2)^2 - (x - 6)^2 - \{[(3x - 7)(3x + 7) - x^2] + 33\} = 0$

40. a) $\frac{5}{x+2} - \frac{6}{x-2} = \frac{3}{x^2-4}$

b) $\frac{7}{2x-1} + \frac{8}{2x+1} = \frac{29}{4x^2-1}$

c) $\frac{2x-3}{x+5} = 5 - \frac{3x-7}{x-4} + \frac{5}{(x+5)(x-4)}$

d) $\frac{16x}{x-5} - \frac{7x}{x+3} = \frac{3x}{x+3} + 6 - \frac{20}{(x-5)(x+3)}$

e) $\frac{4}{2x+3} - \frac{5}{x-1} = \frac{2x-1}{2x+3} - \frac{x+4}{x-1} + \frac{16}{(2x+3)(x-1)}$

f) $\frac{7(x-1)}{x-3} + \frac{5(x+2)}{x+3} = \frac{2(x-4)}{x^2-9} + 12 + \frac{9}{x^2-9}$

41. a) $\frac{x+5}{x+7} = \frac{3x+8}{3(x+4)}$

b) $\frac{3x-7}{x+2} = \frac{3x-4}{x+\frac{7}{11}}$

c) $\frac{3x-7}{4x-3} - \frac{3(x-1)}{4x+15} = 0$

d) $\frac{x-2}{x+4} - \frac{2x+1}{2x+19} = 0$

e) $\frac{5-x}{2+x} - \frac{7+x}{2-x} = \frac{3x}{2+x} + \frac{3x}{2-x} + \frac{17}{4-x^2}$

f) $\frac{5(3+2x)}{7-x} - \frac{3(4+x)}{7+x} = \frac{4(1+3x)}{7-x} + \frac{3-x}{7+x}$

g) $\frac{6(x-2)}{2x-5} + \frac{3(x-4)}{x+3} = \frac{5(2x-1)}{2x-5} + \frac{x+2}{x+3} - \frac{8}{(2x-5)(x+3)}$

42. a) $\frac{5x}{x+1} - \frac{2x}{x+3} = \frac{3x+2}{x+3} + \frac{36}{11(x+1)}$

b) $\frac{7x}{x-1} + \frac{5x}{x+3} = \frac{12x}{x-1} + \frac{8}{x+3}$

c) $\frac{8x}{2x-1} + \frac{3x}{x+3} = \frac{2x}{2x-1} + \frac{6x}{x+3} + \frac{7}{(2x-1)(x+3)}$

d) $\frac{5x^2+3x-2}{7x} - \frac{4x^2-3x+5}{3x} = \frac{-2x^2+x-1}{7x} - \frac{x^2+3x-5}{3x} + \frac{23}{21x}$

e) $\left(\frac{2x+3}{3x}\right)^2 - \left(\frac{5x-2}{2x}\right)^2 = \left(\frac{7x+3}{6x}\right)^2 - \left(\frac{3x-4}{2x}\right)^2 - 4\frac{11}{12}$

f) $\left(\frac{2x-3}{4x}\right)^2 - \left(\frac{3x-5}{8x}\right)^2 - \left(\frac{x+3}{2x}\right)^2 + \frac{9x^2+19}{64x^2} = 0$

g) $\frac{5}{x} - \frac{3}{3x-2} + \frac{4}{x-7} - \frac{2}{x} = \frac{18x}{(3x-2)(x-7)}$

2. PROBLEMI PRVOG STUPNJA S JEDNOM NEPOZNANICOM

a) Aritmetički sadržaj

Problemi iz odnosa među brojevima

43. Oduzmemo li od trokratnika nekog broja broj 5 i tu razliku podijelimo s 2, dobijemo isto kao da od dvokratnika broja oduzmemo 7. Koji je to broj?

44. Dodamo li nekom broju 5, tu sumu podijelimo s 3 i od svega oduzmemo 8, dobijemo isto kao da od dvokratnika broja oduzmemo 18. Koji je to broj?

45. Oduzmemo li od dvokratnika nekog broja broj 7 i tu razliku pomnožimo s 2, dobijemo isto kao da od trokratnika broja oduzmemo 4. Koji je to broj?

46. Razlika dvokratnika broja uvećanog za 1 i trokratnika tog broja umanjenog za 2 jednaka je razlici četverokratnika tog istog broja umanjenog za 3 i samog broja. Koji je to broj?

47. Suma sedmerokratnika broja umanjenog za 1 i peterokratnika istog broja umanjenog za 6 za 3 je veća od četverokratnika tog istog broja uvećanog za 2. Koji je to broj?

48. Razlika četverokratnika broja uvećanog za 3 i peterokratnika istog broja umanjenog za 2 za 14 je manja od trokratnika tog istog broja uvećanog za 4. Koji je to broj?

1046. Opsezi dvaju sličnih trokuta jesu $o = 108$ cm i $o_1 = 288$ cm, a dvije su stranice manjeg trokuta $a = 24$ cm i $b = 36$ cm. Izračunaj sve stranice tih trokuta.

1047. Opseg nekog trokuta iznosi 104 cm. Koliko iznosi opseg o_1 većeg sličnog trokuta ako se homologne stranice odnose kao 4 : 5? Kolike su stranice tih dvaju trokuta ako dvije stranice zadanog trokuta iznose $a = 28$ cm i $b = 32$ cm?

1048. Nacrtaj po volji nepravilan peterokut i uvećaj ga konstrukcijom u omjeru 3 : 5.

1049. Homologne stranice dvaju sličnih trokuta odnose se kao 4 : 7, a površina manjeg trokuta iznosi 160 cm². Izračunaj površinu većeg trokuta. Osnovica većeg trokuta iznosi 35 cm. Izračunaj homolognu osnovicu manjeg trokuta kao i obje visine tih trokuta.

1050. Površine dvaju sličnih trokuta iznose $p = 21{,}87$ cm² i $p_1 = 13{,}23$ cm², a visina većeg trokuta $v = 5{,}4$ cm. Izračunaj visinu manjeg trokuta kao i obje osnovice tih trokuta.

UPUTE I REZULTATI

ALGEBRA

1. LINEARNE JEDNADŽBE S JEDNOM NEPOZNANICOM

Sastavni dio svake jednadžbe je pokus. Stoga se uz rješenje jednadžbe nalazi rezultat pokusa koji se rješava kao identitet, što znači da se kod pokusa ne smijemo koristiti ni jednom ekvivalentnom transformacijom. Pokus se provodi od zadane jednadžbe, a nikako od koje već transformirane ekvivalentne jednadžbe.

1.	a) $x = 2$	$14 = 14$	**2.**	a) $x = 8$	$59 = 59$
	b) $x = 1$	$-4 = -4$		b) $x = 1$	$6 = 6$
	c) $x = 9$	$54 = 55$		c) $x = 7$	$44 = 44$
	d) $x = 10$	$40 = 40$		d) $x = 3$	$-5 = -5$
	e) $x = 4$	$32 = 32$		e) $x = 3$	$12 = 12$
9.	a) $x = 6$	$2 = 2$	**10.**	a) $x = -3$	$7 = 7$
	b) $x = -15$	$12 = 12$		b) $x = -4$	$-2\frac{2}{15} = -2\frac{2}{15}$
	c) $x = -4$	$6 = 6$		c) $x = -3$	$\frac{1}{2} = \frac{1}{2}$
	d) $x = 12$	$-9 = -9$		d) $x = -9$	$-9 = -9$
	e) $x = -6$	$-15 = -15$		e) $x = -5$	$-2\frac{1}{2} = -2\frac{1}{2}$
13.	a) $x = 4$	$\frac{2}{3} = \frac{2}{3}$	**14.**	a) $x = 6$	$\frac{1}{2} = \frac{1}{2}$
	b) $x = 24$	$6 = 6$		b) $x = -2$	$-1\frac{1}{3} = -1\frac{1}{3}$
	c) $x = 7$	$5 = 5$		c) $x = -1$	$-1\frac{1}{7} = -1\frac{1}{7}$
	d) $x = 10$	$0 = 0$		d) $x = -2$	$1 = 1$
	e) $x = 24$	$21 = 21$		e) $x = -6$	$-6\frac{1}{2} = -6\frac{1}{2}$
29.	a) $x = 5$	$3 : 1 = 3 : 1$	**30.**	a) $x = 7$	$3 : 2 = 3 : 2$
	b) $x = 2$	$1 : 2 = 1 : 2$		b) $x = 8$	$4 : 3 = 4 : 3$
	c) $x = 1$	$2 : 3 = 2 : 3$		c) $x = 9$	$3 : 4 = 3 : 4$
	d) $x = 4$	$4 : 1 = 4 : 1$		d) $x = 10$	$7 : 5 = 7 : 5$
	e) $x = 6$	$2 : 1 = 2 : 1$		e) $x = 1$	$3 : 2 = 3 : 2$
	f) $x = 3$	$3 : 5 = 3 : 5$		f) $x = 5$	$1 : 1 = 1 : 1$

35. a) $x = 6$ $\quad -9 = -9$
b) $x = 1$ $\quad 9 = 9$
c) $x = 3$ $\quad -15 = -15$
d) $x = -3$ $\quad -225 = -225$
e) $x = 25$ $\quad 4 = 4$
f) $x = -1$ $\quad 0 = 0$

36. a) $x = 7$ $\quad 260 = 260$
b) $x = 15$ $\quad -151 = -151$
c) $x = 0$ $\quad 0 = 0$
d) $x = 2$ $\quad 5 = 5$
e) $x = 10$ $\quad 0 = 0$
f) $x = 20$ $\quad 169 = 169$

37. a) $x = -3$ $\quad 45 = 45$
b) $x = 4$ $\quad 0 = 0$
c) $x = -2$ $\quad 0 = 0$
d) $x = 25$ $\quad -1250 = -1250$
e) $x = 1$ $\quad 4 = 4$
f) $x = 2$ $\quad 0 = 0$

38. a) $x = 1$ $\quad 0 = 0$
b) $x = -1$ $\quad 0 = 0$
c) $x = 3$ $\quad 0 = 0$
d) $x = 2$ $\quad 0 = 0$
e) $x = 1$ $\quad 27 = 27$
f) $x = 2$ $\quad 5 = 5$

41. a) $x = 2$ $\quad \frac{7}{9} = \frac{7}{9}$
b) $x = \frac{1}{2}$ $\quad -2\frac{1}{5} = -2\frac{1}{5}$
c) $x = 3$ $\quad 0 = 0$
d) $x = 7$ $\quad 0 = 0$
e) $x = -\frac{3}{4}$ $\quad \frac{128}{55} = \frac{128}{55}$
f) $x = -14$ $\quad -10\frac{5}{21} = -10\frac{5}{21}$
g) $x = 1$ $\quad -\frac{1}{4} = -\frac{1}{4}$

42. a) $x = 2{,}5$ $\quad 2\frac{51}{77} = 2\frac{51}{77}$
b) $x = \frac{2}{7}$ $\quad -\frac{272}{115} = -\frac{272}{115}$
c) $x = \frac{1}{3}$ $\quad -7\frac{7}{10} = -7\frac{7}{10}$
d) $x = 2$ $\quad -\frac{11}{14} = -\frac{11}{14}$
e) $x = 4{,}5$ $\quad -\frac{118{,}75}{27} = -\frac{118{,}75}{27}$
f) $x = -1$ $\quad 0 = 0$
g) $x = \frac{3}{4}$ $\quad -8\frac{16}{25} = -8\frac{16}{25}$

2. PROBLEMI PRVOG STUPNJA S JEDNOM NEPOZNANICOM

a) Aritmetički sadržaj

Problemi iz odnosa među brojevima

43. $\frac{3x-5}{2} = 2x - 7$
$x = 9$

44. $\frac{x+5}{3} - 8 = 2x - 18$
$x = 7$

45. $(2x - 7)\,2 = 3x - 4$
$x = 10$

46. $2(x+1) - 3(x-2) = 4(x-3) - x$
$x = 5$

47. $7(x-1) + 5(x-6) = 4(x+2) + 3$
$x = 6$

48. $4(x+3) - 5(x-2) = 3(x+4) - 14$
$x = 6$

50. $\frac{\frac{2}{3}x - 3}{3} = \frac{3x+4}{21}$
$x = 15$

52. $\frac{x}{2} + \frac{x}{3} + \frac{x}{9} = x - 2$
$x = 36$

59. $\frac{x}{2} + \frac{x}{3} + \frac{x}{7} = x - 1$
$x = 42$

60. $\frac{5x-3x}{2} = 2x - 4$
$x = 4$

61. $\frac{x}{2} + \frac{x}{3} + \frac{x}{4} + \frac{x}{6} = 60$
$x = 48$

62. $x + x - 3 + x - 3 - 8 = 40$
$x = 18;\ 15;\ 7$

63. $\frac{3}{4}x - \frac{1}{5}x = 66$
$x = 120$

64. $x - 7 + x + x + 11 = 52$
$x = 16;\ 9;\ 27$

65. $\frac{5}{18}x + \frac{5}{24}x = 53$
$x = 72$

66. $4(x+3) - 3(x-4) = 5(x+1) + 3$
$x = 4$

67. $7(x-1) + 2(x-4) = 3(x+2) + 15$
$x = 6$

68. $6(x-3) - 5(x-6) = 4(x-2) - 1$
$x = 7$

69. $5(x+1) - 3(x-1) = 3x$
$x = 8$

70. $\frac{4\,233}{x} = 120 + \frac{33}{x}$
$x = 35$

71. $\frac{3\,148}{x} = 116 + \frac{16}{x}$
$x = 27$

72. $\frac{2\,376}{x} = 158 + \frac{6}{x}$
$x = 15$

73. $\frac{976}{x} = 36 + \frac{4}{x}$
$x = 27$

74. $3(x-3) + 2(x+2) = 4(x-1) + 6$
$x = 7$

75. $5(x-3) - 3(x-4) = 4(x-6) + 5$
$x = 8$

76. $5(x+3) - 7(x-7) = 4(x+1) + 6$
$x = 9$

77. $8(x-3) + 7(x-9) = 7x - 7$
$x = 10$

78. $\frac{x+8}{3} - 7 = 2x - 21$
$x = 10$

79. $\frac{2x+4}{5} = \frac{x}{4} + 2$
$x = 8$

80. $\frac{14-x}{7} + 5 = x - 1$
$x = 7$

81. $\frac{3}{8}x - 50 = \frac{5}{8}x - 70$
$x = 80$

82. $\frac{x-12}{3} + 18 = 2x - 11$
$x = 15$