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JAKUB MEDVEC

9.A

Prvý stupeň obťažnosti

1. **5x+2=1+3x**

   5x-3x=-2+1

   2x=-1

   x=-1:2

   x=-0,5

   Ľ= 5x+2=5.(-0.5)+2=-0.5

   P=1+3x=1+3.(-0,5)=-0,5

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2. **3+4x-2=5x+8+1x**

   4x-5x-1x=-3+2+8

   -2x=7

   x=7:(-2)

   x=-3,5

   Ľ=3+4x-2=3+4.(-3,5)-2=-13

   P=5x+8+1x=5.(-3,5)+8+1(-3,5)=-13

---

3. **2x+2=x+4**

   2x-x=-2+4

   1x=2

   x=2:1

   x=2

   Ľ=2x+2=2.2+2=6

   P=x+4=2+4=6

---

4. **3+x-1=8+2x**

   1x-2x=-3+1+8

   -1x=6

   x=6(-1)

   x=-6

   Ľ=3+x-1=3+(-6)-1=-4

   P=8+2x=8+2.(-6)=-4

---

5. 4x+1=8+2x

4x-2x=-1+8

2x=7

x=7:2

x=3,5

Ľ=4x+1=4.3,5+1=15

P=8+2x=8+2.3,5=15

---

6. 8+2x-3=1x+3

2x-1x=-8+3+3

1x=-2

x=-2:1

x=-2

Ľ=8+2x-3=8+2.(-2)-3=1

P=1x+3=1.(-2)+3=1

---

7. 7+2+x=3x

x-3x=-7-2

-2x=-9

x=-9:(-2)

x=4,5

Ľ=7+2+x=7+2+4,5=13,5

P=3x=3.4,5=13,5

---

8. 11+x=x+4x

x-x-4x=-11

-4x=-11

x=-11:(-4)

x=2,75

Ľ=11+x=11+2,75=13,75

P=x+4x=2,75+4.2,75=13,75

---

9. 2+3=4x-2x

-4x+2x=-2-3

-2x=-5

x=-5:(-2)

x=2,5

Ľ=2+3=5

P=4x-2x=4.2,5-2.2,5=5

---

10. 1x+2=5x+1

1x-5x=-2+1

-4x=-1

x=-1:(-4)

x=0,25

Ľ=1x+2=1.0,25+2=2,25

P=5x+1=5.0,25+1=2,25

---

11. 1+5x=16+2x

5x-2x=-1+16

3x=15

x=15:3

x=5

Ľ=1+5x=1+5.5=26

P=16+2x=16+2.5=26

---

12. 2x+2=x+4

2x-x=-2+4

1x=2

x=2:1

x=2

Ľ=2x+2=2.2+2=6

P=x+4=6

---

13. x+5=-10 Ľ=-15+5=-10

x=-5-10 P=-10

1x=-15

x=-15:1

x=-15

---

14. 2x-8=20 Ľ=2x-8=2.14-8=20

2x=8+20 P=20

2x=28

x=28:2

x=14

---

15. x+6=10 Ľ=4+6=10

x=-6+10 P=10

1x=4

x=4:1

x=4

Druhý stupeň obťažnosti

16. 15(x+2)=6(2x+7)

15x+30 =12x+42

15x-12x=-30+42

-3x=12

x=12: (-3)

x=4

Ľ=15(x+2)=15(4+2)=90

P=6(2x+7)=6(2.4+7)=90

---

17. 8(9+2x)=5(2-3x)

72+16x=10-15x

16x+15x=-72+10

31x=-62

x=-62:31

x=-2

Ľ=8(9+2x)=8(9+2.(-2))=40

P=5(2-3x)=5(2-3.(-2))=40

---

18. 0,5(x+8)=0,25(20-2x)

0,5x+4=5-0,5x

0,5x+0,5x=-4+5

1x=1

x=1:1

x=1

Ľ=0,5(x+8)=0,5(1+8)=4,5

P=0,25(20-2x)=0,25(20-2.1)=4,5

---

19. 2(x-1)+4(x-3)=2(x+5)+3(x-2)

2x-2+4x-12=2x+10+3x-6

2x+4x-2x-3x=2+12+10-6

1x=18

x=18:1

x=18

Ľ=2(x-1)+4(x-3)=2(18-1)+4(18-3)=94

P=2(x+5)+3(x-2)=2(18+5)+3(18-2)=94

---

20. 2(x-1)-5=3(3+x)+x

2x-2-5=9+3x+x

2x-3x-x=2+5+9

-2x=16

x=16: (-2)

x=-8

Ľ=2(x-1)-5=2(-8-1)-5=-23

P=3(3+x)+x=3(3+(-8))+(-8)=-23

---

21. 4(x-1)-x=3(1+x)-7

4x-4-x=3+3x-7

4x-x-3x=4+3-7

0x=0 má nekonečne veľa riešení

---

22. 7x-(x+3)=3(2x+1)

7x-x-3=6x+3

7x-x-6x=3+3

0x=6 nemá riešenie

23. 4(3x+2)=5(2x-7)+x

12x+8=10x-35+x

12x-10x-x=-8-35

1x=-43

x=-43:1

x=-43

Ľ=4(3x+2)=4(3.(-43)+2)=-508

P=5(2x-7)+x=5(2.(-43)-7)+(-43)=-508

---

24. 13(x-0,1)=6(2x+0,1)

13x-1,3=12x+0,6

13x-12x=1,3+0,6

1x=1,9

x=1,9:1

x=1,9

Ľ=13(x-0,1)=13(1,9-0,1)=23,4

P=6(2x+0,1)=6(2.1,9+0,1)=23,4

---

25. 4x-(x+1)=5

4x-x-1=5

4x-x=1+5

3x=6

x=6:3

x=2

Ľ=4x-(x+1)=4.2-(2+1)=5

P=5

26. x+3x-(x+4)=11

x+3x-x-4=11

x+3x-x=4+11

3x=15

x=15:3

x=5

L′=x+3x-(x+4)=5+3.5-(5+4)=11

P=11

---

27. (5x+6)-2(x-2)=x-2-(x-3)

5x+6-2x+4=x-2-x+3

5x-2x-x+x=-6-4+3-2

3x=-9

x=-9:3

x=-3

L′=(5x+6)-2(x-2)=(5.(-3)+6)-2(-3-2)=1

P=x-2-(x-3)=-3-2-(-3-3)=1

---

28. 2(x-5)+15=3(x-4)+10

2x-10+15=3x-12+10

2x-3x=10-15-12+10

-1x=-7

x=-7: (-1)

x=7

L′=2(x-5)+15=2(7-5)+15=19

P=3(x-4)+10=3(7-4)+10=19

---

29. -0,5(x-2)+1,5x=2x+5

-0,5+1+1,5x=2x+5

-0,5x+1,5x-2x=-1+5

-1x=4

x=4: (-1)

x=-4

Ľ=-0,5(x-2)+1,5x=-0,5(-4-2)+1,5.(-4)=-3

P=2x+5=2.(-4)+5=-3

---

30. 4(x-1)-x=3(1+x)-7

4x-4-x=3+3x-7

4x-x-3x=4+3-7

-1x=0

x=0: (-1)

x=0

Ľ=4(x-1)-x=4(0-1)-0=-4

P=3(1+x)-7=3(1+0)-7=-4

Tretí stupeň obťažnosti

31.

$\frac{x}{3}+\frac{1}{2}=\frac{x}{2}$ /.6 Ľ=$\frac{x}{3}+\frac{1}{2}=\frac{3}{3}+\frac{1}{2}=\frac{6+3}{6}=\frac{9}{6}=\frac{3}{2}$

$6.\frac{x}{3}+6.\frac{1}{2}=6.\frac{x}{2}$

2x+3=3 P=$\frac{3}{2}$

2x-3x=-3

-1x=-3

x=-3: (-1)

x=3

---

32. $\frac{x}{3}+7=8+\frac{x}{4}$ /.12 Ľ=$\frac{x}{3}+7=\frac{12}{3}+\frac{7}{1}=\frac{12+21}{3}=\frac{33}{3}=\frac{11}{1}$

$12.\frac{x}{3}+12.7=12.8+3.\frac{x}{4}$

4x+84=96+3x P=$8+\frac{x}{4}=8+\frac{12}{4}=\frac{8}{1}+\frac{12}{4}=\frac{32+12}{4}=\frac{44}{4}=\frac{11}{1}$

4x-3x=-84+96

1x=12

x =12:1

x=12

---

33. $\frac{3x}{6}-\frac{x}{3}=\frac{5-x}{9}$ /.18 Ľ=$\frac{3x}{6}-\frac{x}{3}=\frac{3.2}{6}-\frac{2}{3}=\frac{6}{6}-\frac{2}{3}=\frac{6-4}{6}=\frac{2}{6}=\frac{1}{3}$

$18.\frac{3x}{6}-18.\frac{x}{3}=18.\frac{5-x}{9}$

9x-6x=10-2x P=$\frac{5-x}{9}=\frac{5-2}{9}=\frac{3}{9}=\frac{1}{3}$

9x+2x-6x=10

5x=10

x=10:5

x=2

---

34. $\frac{6x+1}{8}=0$ /.8 Ľ=$\frac{6x+1}{8}=\frac{6.\left(-\frac{1}{6}\right)+1}{8}=\frac{\frac{6}{1}.(-\frac{1}{6})}{8}=\frac{1}{8}=\frac{0}{8}$

6x+1=0

6x=-1 P=0

x=-1:6

x= $-\frac{1}{6}$

---

35. $\frac{x+8}{3}=4$ /.3 Ľ=$\frac{x+8}{3}=\frac{4+8}{3}=\frac{12}{3}=\frac{4}{1}$

x+8=12

1x=-8+12 P=$\frac{4}{1}$

1x=4

x=4:1

x=4

---

36. $\frac{1-5x}{4} = \frac{3}{2}$ /.4 L'=$\frac{1-5x}{4} = \frac{1-5.(-1)}{4} = \frac{6}{4} = \frac{3}{2}$

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

1-5x=6 P=$\frac{3}{2}$

-5x=-1+5

-5x=5

x=5: (-5)

x=-1

---

37. $x + \frac{5}{3} = 2$ /.3 L'=$x + \frac{5}{3} = \frac{1}{3} + \frac{5}{3} = \frac{6}{3} = \frac{2}{1}$

$3x + 3.\frac{5}{3} = 3.2$

3x+5=6 P=$\frac{2}{1}$

3x=-5+6

3x=1

x=1:3

x=$\frac{1}{3}$

---

38. $\frac{x-7}{5} = 3$ /.5 L'=$\frac{x-7}{5} = \frac{22-7}{5} = \frac{15}{5} = \frac{3}{1}$

$5.\frac{x-7}{5} = 5.3$

x-7=15 P=$\frac{3}{1}$

1x=7+15

1x=22

x=22:1

x=22

---

39. $\frac{x-2}{3} = \frac{x+4}{5}$ /.15 L'=$\frac{x-2}{3} = \frac{11-2}{3} = \frac{9}{3} = \frac{3}{1}$

$15.\frac{x-2}{3} = 15.\frac{x+4}{5}$

$5x-10=3x+12$ P=$\frac{x+4}{5} = \frac{11+4}{5} = \frac{15}{5} = \frac{3}{1}$

$5x-3x=10+12$

$2x=22$

$x=22:2$

$x=11$

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40. $\frac{13+9x}{8} = \frac{1}{2}$ /.8 L'=$\frac{13+9x}{8} = \frac{13+9.(-1)}{8} = \frac{4}{8} = \frac{1}{2}$

$8.\frac{13+9x}{8} = 4.\frac{1}{2}$

$13+9x=4$ P=$\frac{1}{2}$

$9x=-13+4$

$9x=-9$

$x=-9:9$

$x=-1$