The Weekly Rigor

No. 206 "A mathematician is a machine for turning coffee into theorems." June 2, 2018

30 Problems in Clearing Fractions

(Part 2)

ANSWERS

1. 8	2. 15
3. 4	4. 8
5. 12	6. 3
7. 6	8. 12
9. 14	10. 9
11. 30	12. 24
13. 24	14. 35
15. 15	16. 5
17. 12	18. -5
19. 4	20. $\frac{24}{23}$
21. 2	22. 15
23. 5	24. 6
25. 7	26. 9
27. $\frac{25}{11}$	28. 40
29. 16	30. 3

SELECTED SOLUTIONS

1. $x + \frac{x}{4} = 10$

$4 \cdot \left(x + \frac{x}{4}\right) = 10 \cdot 4$

$4x + 4 \cdot \frac{x}{4} = 40$

$4x + x = 40$

$5x = 40$

$x = 8$

7. $x + \frac{x}{2} + \frac{x}{3} = 11$

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

$6x + 6 \cdot \frac{x}{2} + 6 \cdot \frac{x}{3} = 66$

$6x + 3x + 2x = 66$

$11x = 66$

$x = 6$

15. $x + \frac{3x}{5} + \frac{2x}{6} - \frac{x}{2} = \frac{43}{2}$

$30 \cdot \left(x + \frac{3x}{5} + \frac{2x}{6} - \frac{x}{2}\right) = \frac{43}{2} \cdot 30$

$30x + 30 \cdot \frac{3x}{5} + 30 \cdot \frac{2x}{6} - 30 \cdot \frac{x}{2} = 30 \cdot \frac{43}{2}$

$30x + 6 \cdot 3x + 5 \cdot 2x - 15x = 15 \cdot 43$

$30x + 18x + 10x - 15x = 645$

$43x = 645$

$\frac{43x}{43} = \frac{645}{43}$

$x = 15$

17. $\frac{x}{3} - \frac{x-1}{11} = x - 9$

$33 \cdot \left(\frac{x}{3} - \frac{x-1}{11}\right) = (x - 9) \cdot 33$

$33 \cdot \frac{x}{3} - 33 \cdot \frac{x-1}{11} = 33x - 33 \cdot 9$

$11x - 3(x - 1) = 33x - 297$

$11x - 3x + 3 = 33x - 297$

$8x + 3 = 33x - 297$

$300 = 25x$

$\frac{300}{25} = \frac{25x}{25}$

$12 = x$

25. $\frac{x+3}{2} - \frac{x-1}{3} = \frac{x+42}{7} - \frac{x+5}{3}$

$42 \cdot \left(\frac{x+3}{2} - \frac{x-1}{3}\right) = \left(\frac{x+42}{7} - \frac{x+5}{3}\right) \cdot 42$

$42 \cdot \frac{x+3}{2} - 42 \cdot \frac{x-1}{3} = 42 \cdot \frac{x+42}{7} - 42 \cdot \frac{x+5}{3}$

$21(x + 3) - 14(x - 1) = 6(x + 42) - 14(x + 5)$

$21x + 63 - 14x + 14 = 6x + 252 - 14x - 70$

$7x + 77 = 182 - 8x$

$15x = 105$

$\frac{15x}{15} = \frac{105}{15}$

$x = 7$

29. $\frac{x-4}{4} - \frac{x-1}{3} = \frac{x-26}{5}$

$60 \cdot \left(\frac{x-4}{4} - \frac{x-1}{3}\right) = \frac{x-26}{5} \cdot 60$

$60 \cdot \frac{x-4}{4} - 60 \cdot \frac{x-1}{3} = 60 \cdot \frac{x-26}{5}$

$15(x - 4) - 20(x - 1) = 12(x - 26)$

$15x - 60 - 20x + 20 = 12x - 284$

$-5x - 40 = 12x - 284$

$244 = 17x$

$\frac{244}{17} = \frac{17x}{17}$

$16 = x$