

# Solving Linear Equations with Fractions and Brackets

## Unit: Linear Equations - Student Practice Worksheet

*Overview: Arjun stared at  $(2x+1)/3 - (x-2)/4 = 1$  and said equations with fractions in them were a 'different kind of problem.' Meera said they weren't — they just needed one extra first step. That one step turned the whole thing back into the equations he already knew how to solve.*

### Practice Questions (30 Total)

#### Section A - Easy

**Q1. Balance:  $x/2$  equals 8. Find  $x$ .**

$$x/2 = 8$$

- ☐ A.  $x = 4$
- ☐ B.  $x = 16$
- ☐ C.  $x = 10$
- ☐ D.  $x = 6$

**Q2. What is the first step for solving an equation with fractions?**

- ☐ A. Multiply every term by the LCM of the denominators
- ☐ B. Guess a value for  $x$
- ☐ C. Ignore the fractions
- ☐ D. Divide every term by the smallest denominator

**Q3. Solve  $2(x + 3) = 14$ .**

- ☐ A.  $x = 7$
- ☐ B.  $x = 10$
- ☐ C.  $x = 4$
- ☐ D.  $x = 8$

**Q4.  $x/3$  plus 2 equals 5. Find  $x$ .**

$$x/3 + 2 = 5$$

- ☐ A.  $x = 9$
- ☐ B.  $x = 15$
- ☐ C.  $x = 3$
- ☐ D.  $x = 21$

**Q5. How should a solution be verified after clearing fractions?**

- ☐ A. Substitute into the simplified equation only
- ☐ B. No verification is needed
- ☐ C. Only check if  $x$  is positive
- ☐ D. Substitute into the ORIGINAL equation with fractions intact

**Q6. Expand  $-3(x - 2)$ .**

- ☐ A.  $-3x - 6$
- ☐ B.  $3x - 6$
- ☐ C.  $-3x - 2$
- ☐ D.  $-3x + 6$

**Q7.  $2x/5$  equals 6. Find  $x$ .**

$$2x/5 = 6$$

- ☐ A.  $x = 15$
- ☐ B.  $x = 12$
- ☐ C.  $x = 3$
- ☐ D.  $x = 30$

**Q8. What is the LCM of 3 and 4?**

- ☐ A. 7
- ☐ B. 12
- ☐ C. 24
- ☐ D. 1

**Q9. Solve  $3(x - 1) = 12$ .**

- ☐ A.  $x = 3$
- ☐ B.  $x = 4$
- ☐ C.  $x = 5$
- ☐ D.  $x = 13$

**Q10. Expand  $2(3x+1)$ , naming what 2 does to each term.**

- ☐ A.  $6x + 1$
- ☐ B.  $6x + 2$
- ☐ C.  $5x + 2$
- ☐ D.  $3x + 2$

### Section B - Medium

**Q11.  $2(x+3)/5$  equals 4. Clear the denominator and find x.**

$$2(x+3)/5 = 4$$

- ☐ A.  $x = 10$
- ☐ B.  $x = 4$
- ☐ C.  $x = 7$
- ☐ D.  $x = 17$

**Q12. Solve  $(2x+1)/3 - (x-2)/4 = 1$ .**

- ☐ A.  $x = 2/5$
- ☐ B.  $x = 5/2$
- ☐ C.  $x = 2$
- ☐ D.  $x = -2/5$

**Q13. Solve  $3(x - 2) - 2(2x + 1) = 5$ .**

- ☐ A.  $x = 13$
- ☐ B.  $x = -13$
- ☐ C.  $x = -3$
- ☐ D.  $x = 3$

**Q14.  $x/4$  minus  $x/6$  equals 2. Clear with LCM 12.**

$$x/4 - x/6 = 2$$

- ☐ A.  $x = 12$
- ☐ B.  $x = 24$
- ☐ C.  $x = 48$
- ☐ D.  $x = 2$

**Q15. Solve  $(3x+2)/4 = (x-1)/2$ .**

- ☐ A.  $x = 4$
- ☐ B.  $x = -2$
- ☐ C.  $x = 2$
- ☐ D.  $x = -4$

**Q16. Solve  $(x+1)/2 + (x-1)/3 = 3$ .**

- ☐ A.  $x = 3$
- ☐ B.  $x = 4$
- ☐ C.  $x = 2.5$
- ☐ D.  $x = 3.4$

**Q17.  $x/2 + x/3 + x/6 = 12$ . Clear with LCM 6.**

$$x/2 + x/3 + x/6 = 12$$

- ☐ A.  $x = 6$
- ☐ B.  $x = 12$
- ☐ C.  $x = 24$
- ☐ D.  $x = 36$

**Q18. Solve  $4(x-3) = 2(x+5)$ .**

- ☐ A.  $x = 8$
- ☐ B.  $x = -11$
- ☐ C.  $x = 11$

☐ D.  $x = 22$

**Q19. Solve  $5(2x-1) - 3(x+2) = 0$ .**

☐ A.  $x = 11/7$

☐ B.  $x = 7/11$

☐ C.  $x = -11/7$

☐ D.  $x = 1$

**Q20. Expand  $2(x+1) - 3(x-2) = 4x$ , then collect x-terms.**

☐ A.  $x = 8/5$

☐ B.  $x = 5/8$

☐ C.  $x = -8/5$

☐ D.  $x = 2$

### Section C - Challenge

**Q21. Half of a number plus a third of it equals 25. Find the number.**

|                 |                  |        |
|-----------------|------------------|--------|
| <div>half</div> | <div>third</div> | $= 25$ |
|-----------------|------------------|--------|

☐ A. 30

☐ B. 15

☐ C. 50

☐ D. 75

**Q22. The sum of a number and its reciprocal-scaled term  $x/4$  equals  $3x/4 + 5$ . Solve for x if the equation is  $x + x/4 = 3x/4 + 5$ .**

☐ A.  $x = 5$

☐ B.  $x = 20$

☐ C.  $x = 10$

☐ D.  $x = 2.5$

**Q23. A number x satisfies  $(2x+3)/5 = (3x-1)/7$ . Find x.**

☐ A. -26

☐ B. 26

☐ C. 2.6

☐ D. 13

**Q24.  $(x+3)/(x-1)=2$ ,  $x \neq 1$ . Cross-multiply and find  $x$ .**

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

☐ A.  $x = -5$

☐ B.  $x = 5$

☐ C.  $x = 1$

☐ D.  $x = 3$

**Q25. Solve  $(x+2)/3 = (2x-1)/5 + 1$ .**

☐ A.  $x = -2$

☐ B.  $x = 2$

☐ C.  $x = -22$

☐ D.  $x = 11$

**Q26. Solve  $3(2x-1)/4 - (x+2)/2 = 1$ .**

☐ A.  $x = 4/11$

☐ B.  $x = 9$

☐ C.  $x = 11/4$

☐ D.  $x = -11/4$

**Q27. Clear denominators 3, 4, and 6. Solve for  $x$ .**

$$(x-1)/3 - (x-2)/4 = (x-3)/6$$

☐ A.  $x = 8$

☐ B.  $x = -8$

☐ C.  $x = 6$

☐ D.  $x = 3$

**Q28. Solve  $2(3x - 1) + 3(x + 2) = 5(x - 1) + 15$ .**

☐ A.  $x = -1.5$

☐ B.  $x = 5$

☐ C.  $x = 0.5$

☐ D.  $x = 1.5$

**Q29. Solve  $3x/2 - 2(x-1)/3 = 5$ .**

☐ A.  $x = 5/26$

☐ B.  $x = 26/5$

☐ C.  $x = 6$

☐ D.  $x = -26/5$

**Q30. Expand  $5(x+2)-3(2x-1)=2(x+7)$  and solve, watching the minus.**

☐ A.  $x = 1/3$

☐ B.  $x = -3$

☐ C.  $x = 3$

☐ D.  $x = -1/3$

## Answer Key

**Q1:** (B) (b)  $x = 16$ .  $8 \times 2 = 16$ .

**Q2:** (A) (a) Multiply every term by the LCM of the denominators. This clears every fraction at once.

**Q3:** (C) (c)  $x = 4$ . Expand:  $2x+6=14$ , so  $2x=8$ ,  $x=4$ .

**Q4:** (A) (a)  $x = 9$ .  $x/3=3$ , so  $x=9$ .

**Q5:** (D) (d) Substitute into the ORIGINAL equation with fractions intact. This catches any error made while clearing the fractions.

**Q6:** (D) (d)  $-3x + 6$ . Distributing  $-3$  across  $(x-2)$  gives  $-3x$  and  $+6$ .

**Q7:** (A) (a)  $x = 15$ .  $6 \times 5 = 30$ , then  $30 \div 2 = 15$ .

**Q8:** (B) (b) 12. The smallest number both 3 and 4 divide into evenly.

**Q9:** (C) (c)  $x = 5$ . Expand:  $3x-3=12$ , so  $3x=15$ ,  $x=5$ .

**Q10:** (B) (b)  $6x + 2$ . Distribute 2 across both terms:  $2 \times 3x = 6x$ ,  $2 \times 1 = 2$ .

**Q11:** (C) (c)  $x = 7$ . Clear the fraction ( $\times 5$ ):  $2(x+3)=20$ , so  $2x+6=20$ ,  $2x=14$ ,  $x=7$ .

**Q12:** (A) (a)  $x = 2/5$ . Clear fractions ( $\times 12$ ):  $4(2x+1)-3(x-2)=12$ , giving  $8x+4-3x+6=12$ , so  $5x+10=12$ ,  $5x=2$ ,  $x=2/5$ .

**Q13:** (B) (b)  $x = -13$ . Expand:  $3x-6-4x-2=5$ , so  $-x-8=5$ , giving  $-x=13$ ,  $x=-13$ .

**Q14:** (B) (b)  $x = 24$ . Clear fractions ( $\times 12$ ):  $3x-2x=24$ , so  $x=24$ .

**Q15:** (D) (d)  $x = -4$ . Cross-multiply:  $2(3x+2)=4(x-1)$ , so  $6x+4=4x-4$ , giving  $2x=-8$ ,  $x=-4$ .

**Q16:** (D) (d)  $x = 3.4$ . Clear fractions ( $\times 6$ ):  $3(x+1)+2(x-1)=18$ , so  $3x+3+2x-2=18$ , giving  $5x+1=18$ ,  $5x=17$ ,  $x=3.4$ .

**Q17:** (B) (b)  $x = 12$ . Clear fractions ( $\times 6$ ):  $3x+2x+x=72$ , so  $6x=72$ ,  $x=12$ .

**Q18:** (C) (c)  $x = 11$ . Expand:  $4x-12=2x+10$ , so  $2x=22$ ,  $x=11$ .

**Q19:** (A) (a)  $x = 11/7$ . Expand:  $10x-5-3x-6=0$ , so  $7x-11=0$ , giving  $x=11/7$ .

**Q20:** (A) (a)  $x = 8/5$ . Expand:  $2x+2-3x+6=4x$ , so  $-x+8=4x$ , giving  $8=5x$ ,  $x=8/5$ .

**Q21:** (A) (a) 30.  $x/2+x/3=25$ ; clearing ( $\times 6$ ):  $3x+2x=150$ , so  $5x=150$ ,  $x=30$ .

**Q22:** (C) (c)  $x = 10$ . Clear fractions ( $\times 4$ ):  $4x+x=3x+20$ , so  $5x=3x+20$ , giving  $2x=20$ ,  $x=10$ .

**Q23:** (B) (b) 26. Cross-multiply:  $7(2x+3)=5(3x-1)$ , so  $14x+21=15x-5$ , giving  $26=x$ .

**Q24:** (B) (b)  $x = 5$ . Cross-multiply:  $x+3=2(x-1)$ , so  $x+3=2x-2$ , giving  $5=x$ .

**Q25:** (A) (a)  $x = -2$ . Clear fractions ( $\times 15$ ):  $5(x+2)=3(2x-1)+15$ , so  $5x+10=6x-3+15$ , giving  $5x+10=6x+12$ , so  $-2=x$ .

**Q26:** (C) (c)  $x = 11/4$ . Clear fractions ( $\times 4$ ):  $3(2x-1)-2(x+2)=4$ , so  $6x-3-2x-4=4$ , giving  $4x-7=4$ , so  $4x=11$ ,  $x=11/4$ .

**Q27:** (A) (a)  $x = 8$ . Clear fractions ( $\times 12$ ):  $4(x-1)-3(x-2)=2(x-3)$ , so  $4x-4-3x+6=2x-6$ , giving  $x+2=2x-6$ , so  $8=x$ .

**Q28:** (D) (d)  $x = 1.5$ . Expand both sides:  $6x - 2 + 3x + 6 = 5x - 5 + 15$ , so  $9x + 4 = 5x + 10$ , giving  $4x = 6$ , so  $x = 1.5$ .

**Q29:** (B) (b)  $x = 26/5$ . Clear fractions ( $\times 6$ ):  $9x - 4(x - 1) = 30$ , so  $9x - 4x + 4 = 30$ , giving  $5x + 4 = 30$ ,  $5x = 26$ ,  $x = 26/5$ .

**Q30:** (D) (d)  $x = -1/3$ . Expand:  $5x + 10 - 6x + 3 = 2x + 14$ , so  $-x + 13 = 2x + 14$ , giving  $-1 = 3x$ , so  $x = -1/3$ .

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***You've got this! Keep learning and shining! - Ruchi Math Coaching***