

GCSE Maths: Equations with fractions (Higher): answers

GCSE Maths - Linear Equations - Higher - Lesson 9.6

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch09-linear-equations/higher/equations-with-fractions/

Exercise 9F Equations with fractions Non-calculator

1 Solve these equations. Multiply both sides by the bottom number.

(a) $\frac{x+3}{2} = 5$

Answer: $x = 7$

(b) $\frac{x+1}{3} = 4$

Answer: $x = 11$

(c) $\frac{x-2}{5} = 2$

Answer: $x = 12$

(d) $\frac{x+7}{4} = 3$

Answer: $x = 5$

(e) $\frac{x-4}{2} = 6$

Answer: $x = 16$

(f) $\frac{x+5}{6} = 2$

Answer: $x = 7$

2 Solve these equations. The top has two terms.

(a) $\frac{2x+1}{3} = 5$

Answer: $x = 7$

(b) $\frac{3x-2}{4} = 4$

Answer: $x = 6$

(c) $\frac{5x+3}{2} = 14$

Answer: $x = 5$

(d) $\frac{4x-1}{3} = 5$

Answer: $x = 4$

(e) $\frac{2x+5}{7} = 3$

Answer: $x = 8$

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

Answer: $x = 3$

3 Solve these equations. Find the lowest common multiple of the bottoms first.

(a) $\frac{x}{2} + \frac{x}{3} = 10$

Answer: $x = 12$

(b) $\frac{x}{3} + \frac{x}{4} = 7$

Answer: $x = 12$

(c) $\frac{x}{2} - \frac{x}{5} = 6$

Answer: $x = 20$

(d) $\frac{x}{4} + \frac{x}{2} = 9$

Answer: $x = 12$

(e) $\frac{x}{3} + 2 = \frac{x}{2}$

Answer: $x = 12$

(f) $\frac{x}{5} + 3 = \frac{x}{2}$

Answer: $x = 10$

4 Solve these equations.

(a) $\frac{x}{4} + 3 = 8$

Answer: $x = 20$

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

Answer: $x = 18$

(c) $\frac{x}{6} + 2 = 7$

Answer: $x = 30$

(d) $\frac{x}{2} - 3 = 4$

Answer: $x = 14$

5 Half of a number, plus 3, makes 11. Find the number.

Answer: 16

- 6 Ana has read a third of her book and 10 more pages. She has read 40 pages altogether. How many pages are in the book?

Answer: 90 pages

- 7 Kai solves $\frac{x}{2} + 3 = 7$. His first line is $x + 3 = 14$. Explain his mistake and find the correct solution.

Answer: He did not multiply the 3 by 2. $x + 6 = 14$, so $x = 8$.

- 8 Three numbers are x , $x + 4$ and $x + 8$. Their mean is 12. Find the three numbers.

Answer: 8, 12 and 16

- 9 Show that $x = 6$ is the solution of $\frac{x}{2} + \frac{x}{3} = 5$.

Answer: Both sides equal 5

- 10 Solve these equations.

(a) $\frac{x+1}{2} + \frac{x+2}{3} = 7$

Answer: $x = 7$

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

Answer: $x = 12$

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

Answer: $x = 6$

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

Answer: $x = 3$

- 11 Solve these equations. There is a fraction on each side.

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

Answer: $x = 7$

(b) $\frac{3x+1}{4} = \frac{2x+2}{3}$

Answer: $x = 5$

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

Answer: $x = 11$

- 12 Solve these equations. The unknown is in the bottom of the fraction.

(a) $\frac{12}{x} = 3$

Answer: $x = 4$

(b) $\frac{6}{x-1} = 2$

Answer: $x = 4$

(c) $\frac{18}{2x-1} = 6$

Answer: $x = 2$

(d) $\frac{15}{x+2} = 3$

Answer: $x = 3$

13 Solve $\frac{3}{x-2} = \frac{2}{x+1}$.

Answer: $x = -7$

14 Explain why $x = 2$ cannot be a solution of $\frac{5}{x-2} = 10$, even though $5 \div (2 - 2)$ might look as though it works.

Answer: It makes the denominator 0, and you cannot divide by 0.