# Year 10A linear equations worksheet

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Name: _____ Date: _____

**Question 1**

Solve (x + 3)/(4) = 7.

Answer: _____

**Question 2**

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

Answer: _____

**Question 3**

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

Answer: _____

**Question 4**

Solve x/5 - 1 = 3.

Answer: _____

**Question 5**

Layla and her friend Marcus save up to buy a video game together. Marcus contributes $15 more than Layla. One quarter of Marcus's contribution covers the online activation fee, which costs $12. Let x represent Layla's contribution in dollars. Write an equation and solve it to find how much each person contributes.

Answer: _____

**Question 6**

Solve (2x - 1)/(3) = 3.

Answer: _____

**Question 7**

Solve the equation (x+1)/(3) = (2x-1)/(5)

Answer: _____

**Question 8**

Solve each equation.

(a) (x - 3)/(4) - (2x + 1)/(6) = -2

(b) (2x + 3)/(5) = (x - 1)/(2) + 1

Answer: _____

**Question 9**

Solve (2x - 3)/(5) = (x + 2)/(3).

Answer: _____

**Question 10**

Solve each equation.

(a) 6/x + ½ = 2

(b) (3)/(x - 2) = (5)/(x + 2)

(c) 5/x - 1/3x = 7/9

Answer: _____

# Year 10A linear equations: answers and worked solutions

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**Question 1**

**Key idea:** Multiply both sides by the denominator to eliminate the fraction, then solve.

1. Multiply both sides by 4:\ 4 × (x+3)/(4) = 7 × 4  x + 3 = 28 2. Subtract 3 from both sides:\ x = 25 3. **Check:** (25 + 3)/(4) = 28/4 = 7 ✓

**Answer:** x = 25

**Question 2**

**Key idea:** Multiply every term by the lowest common denominator, 12, to clear the fractions.

1. 4(x + 2) - 3(x - 1) = 24 2. 4x + 8 - 3x + 3 = 24 3. x + 11 = 24, so x = 13

**Answer:** x = 13

**Question 3**

**Key idea:** Find the LCD of both denominators, multiply every term by it to eliminate all fractions, then solve.

1. The LCD of 3 and 5 is 15. Multiply both sides by 15:\ 15 × (x+1)/(3) = 15 × (2x-1)/(5)  5(x + 1) = 3(2x - 1) 2. Expand the brackets:\ 5x + 5 = 6x - 3 3. Subtract 5x from both sides:\ 5 = x - 3 4. Add 3 to both sides:\ x = 8 5. **Check:** (8+1)/(3) = 9/3 = 3 and (2(8)-1)/(5) = 15/5 = 3 ✓

**Answer:** x = 8

**Question 4**

**Answer:** x = 20

**Question 5**

**Key idea:** Translate the real-life information into an equation involving an algebraic fraction, then solve by multiplying both sides by the denominator.

1. Marcus contributes x + 15 dollars. One quarter of Marcus's contribution equals 12, so:\ (x + 15)/(4) = 12 2. Multiply both sides by 4:\ x + 15 = 48 3. Subtract 15 from both sides:\ x = 33 4. Marcus's contribution: x + 15 = 33 + 15 = 48 dollars. 5. **Check:** 48/4 = 12 ✓

**Answer:** Layla contributes $33 and Marcus contributes $48.

**Question 6**

**Answer:** x = 5

**Question 7**

**Key idea:** Multiply both sides by the LCD to clear all fractions, then solve the resulting linear equation.

1. Find the LCD of 3 and 5: LCD = 15. 2. Multiply every term on both sides by 15:\ 15 × (x+1)/(3) = 15 × (2x-1)/(5) 3. Simplify each side:\ 5(x+1) = 3(2x-1) 4. Expand the brackets:\ 5x + 5 = 6x - 3 5. Solve for x:\ 5 + 3 = 6x - 5x  8 = x  6. Check by substituting x = 8 back into the original equation: (8+1)/(3) = 9/3 = 3 and (2(8)-1)/(5) = 15/5 = 3. Both sides are equal.

**Answer:** x = 8

**Question 8**

**Answer:** (a) x = 13 (3(x - 3) - 2(2x + 1) = -24) (b) x = 1 (2(2x + 3) = 5(x - 1) + 10)

**Question 9**

**Key idea:** Find the LCD of both denominators, multiply every term by it to eliminate all fractions, then solve.

1. The LCD of 5 and 3 is 15. Multiply both sides by 15:\ 15 × (2x-3)/(5) = 15 × (x+2)/(3)  3(2x - 3) = 5(x + 2) 2. Expand both sides:\ 6x - 9 = 5x + 10 3. Subtract 5x from both sides:\ x - 9 = 10 4. Add 9 to both sides:\ x = 19 5. **Check:** (2(19)-3)/(5) = 35/5 = 7 and (19+2)/(3) = 21/3 = 7 ✓

**Question 10**

**Answer:** (a) x = 4 (6/x = 3/2) (b) x = 8 (3(x + 2) = 5(x - 2)) (c) x = 6 (14/3x = 7/9)