🔢 Class 5 Basic Algebra Worksheet

By Thinking Juggernaut

Name: _____   Date: _____   Score: _____/24

📚 What is Algebra?

Algebra is like a mathematical puzzle where we use **letters** (called variables) to represent unknown numbers.

Key Terms:

- **Variable:** A letter that represents an unknown number (like x, y, or n)
- **Expression:** A combination of numbers, variables, and operations (like 3x + 5)
- **Equation:** A mathematical statement where two expressions are equal (like x + 7 = 12)
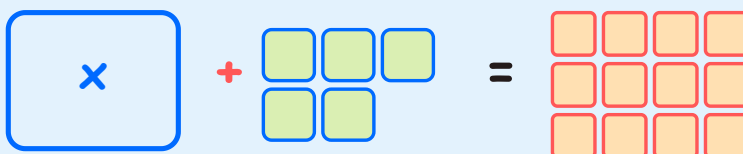
Important Rules:

- To find the value of a variable, we need to isolate it on one side
- Whatever we do to one side of the equation, we must do to the other side
- We can add, subtract, multiply, or divide both sides by the same number

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📝 Sample Problem

Problem: If x + 5 = 12, what is the value of x?

x + 5 = 12

Solution:

Step 1: Write the equation → x + 5 = 12

Step 2: Subtract 5 from both sides → x + 5 - 5 = 12 - 5

Step 3: Simplify → x = 7

Answer: x = 7

💡 **Remember:** Whatever you do to one side, do the same to the other side!

Part A: Warm-up Questions

⭐ Easy Level

1. If x + 3 = 8, then x = _____

2. If y - 4 = 6, then y = _____

3. If 2 × n = 10, then n = _____

4. If m ÷ 3 = 4, then m = _____

5. Fill in the blank: 7 + a = 15, so a = _____

6. **Picture Problem:** Ravi has some mangoes. He buys 6 more mangoes. Now he has 14 mangoes in total.

? + 🟠🟠🟠🟠🟠🟠 = **14**

Write an equation: _____

How many mangoes did Ravi have at first? _____

7. **True or False:** If $p + 9 = 16$, then $p = 7$

☐ True   ☐ False

8. Complete the pattern: If $x + 2 = 9$, then $x =$ ____. If $x + 3 = 10$, then $x =$ ____. If $x + 4 = 11$, then $x =$ _____

Part B: Practice Questions

⭐⭐ **Medium Level**

9. Solve: $3x + 4 = 19$

Show your work:

$x =$ _____

10. If $5y - 8 = 17$, what is the value of y?

Step 1: _____

Step 2: _____

$y =$ _____

11. **Word Problem:** Priya is thinking of a number. When she multiplies it by 4 and adds 7, she gets 31. What number is Priya thinking of?

Equation: _____

The number is: _____

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12. **Picture Problem**: A basket has some apples. Aarav puts 8 more apples in it. Then his sister takes away 5 apples. Now there are 15 apples in the basket.

$$\boxed{\times} \; + 8 \; - 5 \; = \; \textbf{15}$$

Equation: _____

Apples at first: _____

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13. If $n \div 6 + 3 = 8$, find the value of n.

n = _____

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14. **Match the Following:**

Column A (Equation)	Column B (Value)
1. x + 6 = 13	a. 8
2. 2y = 16	b. 3
3. m - 5 = 3	c. 7
4. p ÷ 4 = 2	d. 12

1-____, 2-____, 3-____, 4-____

15. **Word Problem:** A school bus has some students. At the first stop, 12 students get on. At the second stop, 7 students get off. Now there are 28 students on the bus. How many students were on the bus initially?

Equation: _____
Initial students: _____

16. Solve: 20 - 3x = 8

x = _____

17. If 2(a + 5) = 22, what is the value of a?

a = _____

18. **True or False:** If 4m - 6 = 10, then m = 4

☐ True   ☐ False

Part C: Challenge Questions

⭐⭐⭐ **Hard Level**

19. **Word Problem:** Rahul and Sneha together have ₹200. Rahul has ₹30 more than Sneha. How much money does Sneha have?

If Sneha has x rupees, then Rahul has: _____

Equation: _____

Sneha has: _____

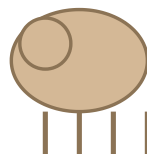**20.** If 3(x - 4) + 5 = 20, find the value of x.

Step 1: _____

Step 2: _____

Step 3: _____

x = _____

21. **Picture Problem:** A farmer has chickens and goats. The total number of legs is 26. The number of chickens is 3 more than the number of goats. How many goats does the farmer have?

2 legs

4 legs

(Hint: Chickens have 2 legs, Goats have 4 legs)

If number of goats = x, then chickens = _____

Equation for legs: _____

Number of goats: _____

22. Solve: $5(2x - 3) = 35$

x = _____

23. **Word Problem:** In a class, there are some girls and boys. The number of boys is 5 less than twice the number of girls. If there are 35 students in total and 12 girls, verify if this is correct by forming an equation.

If girls = 12, then boys = _____
Total students = _____
Is the information correct? _____

24. If $x/4 + 7 = 15$, find the value of x.

Step 1: _____
Step 2: _____
x = _____

📝 Answer Key

Part A: Warm-up (Easy)

1. x = 5

2. y = 10

3. n = 5

4. m = 12

5. a = 8

6. Equation: x + 6 = 14; Ravi had 8 mangoes

7. True

8. $x = 7$ (Pattern: subtract the added number from the total)

Part B: Practice (Medium)

9. $x = 5$ ($3x = 15$, $x = 15÷3$)

10. $y = 5$ ($5y = 25$, $y = 25÷5$)

11. Equation: $4x + 7 = 31$; Number = 6

12. Equation: $x + 8 - 5 = 15$; Apples = 12

13. $n = 30$ ($n÷6 = 5$, $n = 30$)

14. 1-c, 2-a, 3-a, 4-a

15. Equation: $x + 12 - 7 = 28$; Initially 23 students

16. $x = 4$ ($3x = 12$, $x = 4$)

17. $a = 6$ ($a + 5 = 11$, $a = 6$)

18. True ($4m = 16$, $m = 4$)

Part C: Challenge (Hard)

19. Rahul has $x + 30$; Equation: $x + (x + 30) = 200$; Sneha has ₹85

20. $x = 9$ ($3(x-4) = 15$; $x-4 = 5$; $x = 9$)

21. Chickens = $x + 3$; Equation: $4x + 2(x+3) = 26$; Goats = 3 (Chickens = 7)

22. $x = 5$ ($2x - 3 = 7$; $2x = 10$; $x = 5$)

23. Boys = $2(12) - 5 = 19$; Total = 31; No, incorrect (should be 31, not 35)

24. $x = 32$ ($x/4 = 8$; $x = 32$)

📊 Scoring Guide

Total Questions: 24 | Total Marks: 24

Score Range	Performance Level	What to Do Next
20-24	⭐⭐⭐ Excellent!	You're an algebra champion! Try solving equations with fractions and more complex word problems.
15-19	⭐⭐ Very Good!	Great progress! Practice more multi-step equations and word problems with two variables.
10-14	⭐ Good Effort!	Keep practicing! Focus on understanding the concept of balancing equations and isolating variables.
0-9	Keep Trying!	Review the concept section carefully. Practice simple one-step equations daily before moving to harder ones.

📝 **Tips for Improvement:**

- **Balance the equation:** Whatever you do to one side, do to the other side
- **Work step by step:** Don't try to solve everything in one step
- **Isolate the variable:** Get the letter alone on one side of the equation
- **Use inverse operations:** Addition ↔ Subtraction, Multiplication ↔ Division
- **Check your answer:** Substitute your answer back into the original equation
- **Draw pictures:** Visual representations help understand word problems better

🎯 **Common Mistakes to Avoid:**

- ❌ Forgetting to do the same operation on both sides
- ❌ Making calculation errors (use a rough notebook to show work)
- ❌ Not simplifying inside brackets first
- ❌ Mixing up addition and subtraction or multiplication and division
- ❌ Not checking if your answer makes sense in the original problem

✨ **Great Job Completing This Worksheet!** ✨

Keep practicing algebra and you'll master it in no time!

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