Worksheet: Introduction to Solving Algebraic Equations

An **equation** is a mathematical sentence that shows two expressions are equal.
Your goal is to **find the value of the variable** that makes the equation true.
Golden Rule of Solving Equations
Whatever you do to one side of the equation, you must do to the other side.
This keeps the equation balanced.

Steps for Solving One-Step Equations

1. Addition

If a number is **added** to the variable, **subtract** it.
Example:

$x + 5 = 12$

Subtract 5 from both sides.

$x + 5 - 5 = 12 - 5$

$x = 7$

2. Subtraction

If a number is **subtracted** from the variable, **add** it.
Example:

$y - 8 = 15$

Add 8 to both sides.

$y = 23$

3. Multiplication

If the variable is **multiplied** by a number, **divide** both sides.
Example:

$4m = 28$

Divide both sides by 4.

$m = 7$

4. Division

If the variable is **divided** by a number, **multiply** both sides.
Example:

$\frac{p}{6} = 9$

Multiply both sides by 6.

$p = 54$

Checking Your Answer

Always substitute your answer back into the original equation.

Example:	Solution:	Check:
$x + 5 = 12$	$x = 7$	$7 + 5 = 12$ $12 = 12$ ✓

Part A – Solve by Subtracting - Solve each equation.

1. $x + 8 = 15$
   $x = \square$
2. $y + 12 = 25$
   $y = \square$
3. $m + 9 = 18$
   $m = \square$
4. $a + 14 = 30$
   $a = \square$
5. $n + 7 = 21$
   $n = \square$
6. $b + 20 = 45$
   $b = \square$

Part B – Solve by Adding

7. $x - 6 = 10$
   $x = \square$
8. $y - 9 = 17$
   $y = \square$
9. $m - 13 = 8$
   $m = \square$
10. $a - 15 = 20$
    $a = \square$
11. $p - 18 = 22$
    $p = \square$
12. $c - 25 = 30$
    $c = \square$

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Part C – Solve by Dividing

13. $5x = 40$
$x = \square$

14. $6y = 42$
$y = \square$

15. $8m = 56$
$m = \square$

16. $9a = 81$
$a = \square$

17. $12n = 96$
$n = \square$

18. $7p = 63$
$p = \square$

Part D – Solve by Multiplying

19. $\frac{x}{4} = 7$
$x = \square$

20. $\frac{y}{5} = 9$
$y = \square$

21. $\frac{m}{8} = 6$
$m = \square$

22. $\frac{a}{3} = 12$
$a = \square$

23. $\frac{n}{10} = 4$
$n = \square$

24. $\frac{p}{9} = 8$
$p = \square$

Part E – Mixed Practice

25. $x + 11 = 24$
$x = \square$

26. $y - 16 = 5$
$y = \square$

27. $7m = 49$
$m = \square$

28. $\frac{a}{6} = 8$
$a = \square$

29. $b + 19 = 41$
$b = \square$

30. $c - 22 = 14$
$c = \square$

31. $9d = 72$
$d = \square$

32. $\frac{e}{7} = 5$
$e = \square$

33. $f + 18 = 39$
$f = \square$

34. $g - 11 = 29$
$g = \square$

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