

## Algebra 3.2.1 Practice Problems Worksheet

1. Represent the equation  $x + 3 = 7$  using algebra tiles. Solve for  $x$  using the tile method.
2. Translate the equation  $2x + 4 = 10$  into algebra tiles and solve it step-by-step.
3. Use algebra tiles to simplify and solve  $3x - 2 = 7$ .
4. Represent  $x - 5 = -3$  using algebra tiles. Solve for  $x$ .
5. Solve  $4x + 1 = 13$  by modeling it with algebra tiles and then writing the corresponding algebraic steps.
6. Create a visual representation for  $2x - 6 = 8$  using algebra tiles. Solve and verify your solution.
7. Solve  $5x + 3 = 23$  using algebra tiles, and write the algebraic steps as you progress.
8. Model and solve  $x/2 + 3 = 5$  using algebra tiles.
9. Use algebra tiles to solve the inequality  $3x + 2 \leq 14$ . Represent the solution graphically on a number line.
10. Represent and solve  $2x - 3 = 7$  using algebra tiles. Explain each step in your solution.
11. Solve  $x + 4 - 2 = 6$  using algebra tiles and algebraic methods. Compare the solutions.
12. Represent  $3(x - 2) = 9$  using algebra tiles and solve for  $x$ .
13. Solve  $4x - 2x + 5 = 15$  by simplifying first and then using algebra tiles.
14. Represent the inequality  $x/3 + 2 \geq 4$  using algebra tiles and solve it step-by-step.
15. Create a model for  $6x + 2 = 20$  using algebra tiles, solve, and write the algebraic equivalent steps.

## Solutions to Algebra 3.2.1 Problems

1. The equation  $x + 3 = 7$  is represented by one  $x$  tile and three constant tiles on one side, and seven constant tiles on the other side. Removing three constant tiles from both sides,  $x = 4$ .
2. For  $2x + 4 = 10$ , two  $x$  tiles and four constant tiles equal ten constant tiles. Removing four tiles from both sides and dividing the remaining six tiles into two groups,  $x = 3$ .
3. Simplify  $3x - 2 = 7$  by adding two tiles to both sides, giving  $3x = 9$ . Dividing the tiles into three groups,  $x = 3$ .
4. For  $x - 5 = -3$ , adding five constant tiles to both sides gives  $x = 2$ .
5.  $4x + 1 = 13$ : Remove one tile from both sides to get  $4x = 12$ . Divide into four groups,  $x = 3$ .
6. Simplify  $2x - 6 = 8$  by adding six tiles to both sides, giving  $2x = 14$ . Divide into two groups,  $x = 7$ .
7.  $5x + 3 = 23$ : Remove three tiles from both sides to get  $5x = 20$ . Divide into five groups,  $x = 4$ .
8. For  $x/2 + 3 = 5$ : Subtract three tiles from both sides, giving  $x/2 = 2$ . Multiply both sides by two,  $x = 4$ .
9. Solve  $3x + 2 \leq 14$  by removing two tiles from both sides, giving  $3x \leq 12$ . Divide into three groups,  $x \leq 4$ . Graph on a number line:  $x \leq 4$ .
10. Simplify  $2x - 3 = 7$  by adding three tiles to both sides, giving  $2x = 10$ . Divide into two groups,  $x = 5$ .
11. Simplify  $x + 4 - 2 = 6$  by combining constants to get  $x + 2 = 6$ , then subtracting two tiles from both sides,  $x = 4$ .
12. Represent  $3(x - 2) = 9$  by expanding to  $3x - 6 = 9$ , then adding six tiles to both sides to get  $3x = 15$ . Dividing into three groups,  $x = 5$ .
13. Simplify  $4x - 2x + 5 = 15$  to  $2x + 5 = 15$ , subtract five tiles from both sides, giving  $2x = 10$ . Divide into two groups,  $x = 5$ .
14. For  $x/3 + 2 \geq 4$ , subtract two tiles from both sides to get  $x/3 \geq 2$ . Multiply both sides by three,  $x \geq 6$ .
15. For  $6x + 2 = 20$ , remove two tiles from both sides to get  $6x = 18$ . Divide into six groups,  $x = 3$ .