

# Factoring with the Greatest Common Factor

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

The *GCF* is the largest factor shared by all terms – include common numbers *and* common variables. Factor the GCF out front and write what is left in parentheses. Check by distributing back.

▶ **Example:** Factor  $6x + 9$ . **Work:** The GCF of 6 and 9 is 3. Divide each term by 3:  $3(2x + 3)$ .

★ **Answer:**  $3(2x + 3)$

$$6x + 9 \xrightarrow{\text{GCF } 3} 3(2x + 3)$$

Pull out the common factor.

### ◆ Practice Problems

Factor out the greatest common factor.

- |   |  |
|---|--|
| <p>1. <math>6x + 9</math> _____</p> <p>2. <math>4x + 8</math> _____</p> <p>3. <math>10x - 15</math> _____</p> <p>4. <math>3x^2 + 6x</math> _____</p> <p>5. <math>12x - 18</math> _____</p> <p>6. <math>5x^2 + 10x</math> _____</p> <p>7. <math>8x + 12</math> _____</p> | <p>8. <math>9x^2 - 3x</math> _____</p> <p>9. <math>14x + 21</math> _____</p> <p>10. <math>2x^2 + 8x</math> _____</p> <p>11. <math>15x - 25</math> _____</p> <p>12. <math>6x^2 + 9x</math> _____</p> <p>13. <math>4x^2 - 6x</math> _____</p> <p>14. <math>20x + 30</math> _____</p> |
|---|--|

### ◆ Word Problems

15. A workshop has  $8x + 20$  total fasteners grouped into identical packets. Factor the expression to show the common packet size. \_\_\_\_\_
16. A rectangle's area is  $6x^2 + 9x$ . Factor it. \_\_\_\_\_
17. A banner uses  $12x^2 - 8x$  square inches of vinyl after trimming. Factor the expression to show the shared strip size. \_\_\_\_\_
18. A snack table has  $7x + 14$  items arranged in equal rows. Factor the expression to show the common row size. \_\_\_\_\_



## Answer Keys

1.  $3(2x + 3)$

2.  $4(x + 2)$

3.  $5(2x - 3)$

4.  $3x(x + 2)$

5.  $6(2x - 3)$

6.  $5x(x + 2)$

7.  $4(2x + 3)$

8.  $3x(3x - 1)$

9.  $7(2x + 3)$

10.  $2x(x + 4)$

11.  $5(3x - 5)$

12.  $3x(2x + 3)$

13.  $2x(2x - 3)$

14.  $10(2x + 3)$

15.  $4(2x + 5)$

16.  $3x(2x + 3)$

17.  $4x(3x - 2)$

18.  $7(x + 2)$

### Step-by-Step Explanations

1. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 3:  $3(2x + 3)$ . So the final answer is  $3(2x + 3)$ .

2. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4:  $4(x + 2)$ . So the final answer is  $4(x + 2)$ .

3. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 5:  $5(2x - 3)$ . So the final answer is  $5(2x - 3)$ .

4. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $3x$ :  $3x(x + 2)$ . So the final answer is  $3x(x + 2)$ .

5. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 6:  $6(2x - 3)$ . So the final answer is  $6(2x - 3)$ .

6. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $5x$ :  $5x(x + 2)$ . So the final answer is  $5x(x + 2)$ .

7. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4:  $4(2x + 3)$ . So the final answer is  $4(2x + 3)$ .

8. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $3x$ :  $3x(3x - 1)$ . So the final answer is  $3x(3x - 1)$ .

9. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 7:  $7(2x + 3)$ . So the final answer is  $7(2x + 3)$ .

10. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $2x$ :  $2x(x + 4)$ . So the final answer is  $2x(x + 4)$ .

11. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 5:  $5(3x - 5)$ . So the final answer is  $5(3x - 5)$ .

12. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $3x$ :  $3x(2x + 3)$ . So the final answer is  $3x(2x + 3)$ .

13. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $2x$ :  $2x(2x - 3)$ . So the final answer is  $2x(2x - 3)$ .

14. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 10:  $10(2x + 3)$ . So the final answer is  $10(2x + 3)$ .

15. Step by step: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 4:  $4(2x + 5)$ . So the final answer is  $4(2x + 5)$ .

16. Take it one move at a time: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $3x$ :  $3x(2x + 3)$ . So the final answer is  $3x(2x + 3)$ .

17. Start by naming the process: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF  $4x$ :  $4x(3x - 2)$ . So the final answer is  $4x(3x - 2)$ .

18. A good way to think about this is: Look for the greatest factor shared by every term, factor it outside, and leave the remaining pieces in parentheses. The setup/work is GCF 7:  $7(x + 2)$ . So the final answer is  $7(x + 2)$ .



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