

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.

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

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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