

Definitions:

- **Factor:** If a integer a is divisible by an integer b , then b is a factor of a .
- **Greatest Common Factor (GCF) of a and b :** is the largest common factor of a and b .

Important Properties:

- The exponent on a variable in the GCF is the smallest exponent that appears on that variable in all terms listed. For example, the GCF for $2x^2y^2$, $3x^3y$, and $4x^4y^3$ is x^2y .

PROBLEMS

Factor out the GCF for each problem.

1. $6x^2 - 15x$

$$\frac{6x^2 - 15x}{3x(2x - 5)}$$

2. $-3x^3y - 9x^2$

$$\frac{-3x^3y - 9x^2}{-3x^2(xy - 3)}$$

3. $9x - 27y - 81$

$$\frac{9x - 27y - 81}{9(x - 3y - 9)}$$

4. $7x^3 + 14x^2$

$$\frac{7x^3 + 14x^2}{7x^2(x + 2)}$$

5. $2x - 20y - 4y^2$

$$\frac{2x - 20y - 4y^2}{2(x - 10y - 2y^2)}$$

6. $-15x^5y^4 + 10x^3y^5$

$$\frac{-15x^5y^4 + 10x^3y^5}{-5x^3y^4(3x^2 - 2y)}$$

OR

$$\frac{5x^3y^4(-3x^2 + 2y)}$$

7. $-40x^8y^7 - 16x^9y^5$

$$\frac{-40x^8y^7 - 16x^9y^5}{-8x^8y^5(5y^2 + 2x)}$$

8. $4x^3y - 12x^2y^2 + 8x^2y$

$$\frac{4x^3y - 12x^2y^2 + 8x^2y}{4x^2y(x - 3y + 2)}$$

9. $18x^3y^3 - 12x^3y^2 + 6x^5y^2$

$$\frac{18x^3y^3 - 12x^3y^2 + 6x^5y^2}{6x^3y^2(3y - 2 + x^2)}$$

10. $16(x + 2) - x(x + 2)$

$$\frac{16(x + 2) - x(x + 2)}{(x + 2)(16 - x)}$$

11. $3x(2x + 3) - 5(2x + 3)$

$$\frac{3x(2x + 3) - 5(2x + 3)}{(2x + 3)(3x - 5)}$$

12. $x(y + 3) - (y + 3)$

$$\frac{x(y + 3) - (y + 3)}{(y + 3)(x - 1)}$$

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

$$\frac{3x^2(x + 3) - (x + 3)}{(x + 3)(3x^2 - 1)}$$