

Algebra 1
Intro to Factoring - GCF

Name: _____

Date: _____

Use the Distributive Property to simplify.

1. $5(2x - 4)$ $10x - 20$

2. $-7x^3y(2x - 4y)$ $-14x^4y + 28x^3y^2$

Fill in each blank with a monomial that will make each equation true.

3. $10x - 20 =$ 5 $(2x - 4)$

4. $10x^2 - 15x =$ $5x$ $(2x - 3)$

5. $10x^4y - 20x^3y^2 =$ $5x^3y$ $(2x - 4y)$

6. $8x^2 - 4x + 12 =$ 4 $(2x^2 - x + 3)$

Greatest Common Factor (GCF)

1. 3 9 12 3

2. 8 12 20 4

3. -9 15 -24 ± 3

4. 28 49 7

5. x x^2 x

6. x^3 x^2 x^7 x^2

7. $6x^2$ $8x$ $14x^3$ $2x$

Factoring Polynomials

The GCF for a polynomial is the largest monomial that divides (is a factor of) into each term of the polynomial.

Ex: What is the GCF? $4x^2 - 16x$

Answer:

$4x$

Factor the following polynomials by removing the GCF.

1. $15x + 9xy$ $3x(5 + 3y)$ 2. $12a^2b - 3a^2b^3 + 18a$ $3a(4ab - ab^3 + 6)$

3. $-8xy^3 + 20x^2y^2z - 4x$ $-4x(2y^3 - 5xy^2z + 1)$ 4. $32m^4n + 24mn^2 - 16mn$ $8mn(4m^3 + 3n - 2)$
 $\stackrel{OR}{=}$ $4x(-2y^3 + 5xy^2z - 1)$

If an expression will not factor then it is said to be

Factor each. If it will not factor (does not have a GCF), write PRIME.

1. $3x - 5x^2$ $x(3 - 5x)$ 2. $4ab + 5ba^2$ $ab(4 + 5a)$

3. $8z^2 + 21r^2$ PRIME 4. $4m^2 + 6m - 1$ PRIME

What do these terms have in common? $x(x - 4) + 5(x - 4)$ _____ Factor out the GCF

1. $2x(x + 6) + 7(x + 6)$ $(x + 6)(2x + 7)$ 2. $4a(ab - 2) - b(ab - 2)$ $(ab - 2)(4a - b)$

3. $3y(y + 6) - 2z(y + 6) + 4(y + 6)$ $(y + 6)(3y - 2z + 4)$ *4. $x(z - 4) + 9(4 - z)$

~~$x(z - 4) + 9(4 - z)$~~
 $-x(4 - z) + 9(4 - z)$
 $(4 - z)(-x + 9)$

Greatest Common Factor

answers on back

Factor the common factor out of each expression.

1) $9 + 8b^2$

2) $x - 5$

3) $45x^2 - 25$

4) $1 + 2n^2$

5) $56 - 35p$

6) $50x - 80y$

7) $7ab - 35a^2b$

8) $27x^2y^5 - 72x^3y^2$

9) $-3a^2b + 6a^3b^2$

10) $8x^3y^2 + 4x^3$

11) $-5x^2 - 5x^3 - 15x^4$

12) $-32n^9 + 32n^6 + 40n^5$

13) $20x^4 - 30x + 30$

14) $21p^6 + 30p^2 + 27$

15) $28m^4 + 40m^3 + 8$

16) $-10x^4 + 20y^2 + 12x$

17) $30b^9 + 5ab - 15a^2$

18) $27y^7 + 12y^2x + 9y^2$

19) $-48a^2b^2 - 56a^3b - 56a^5b$

20) $30m^6 + 15mn^2 - 25$

21) $20x^8y^2z^2 + 15x^5y^2z + 35x^3y^3z$

22) $3p + 12q - 15q^2r^2$

23) $50x^2y + 10y^2 + 70xz^2$

24) $30y^4z^3x^5 + 50y^4z^5 - 10y^4z^3x$

25) $30qpr - 5qp + 50q$

26) $28b + 14b^2 + 35b^3 + 7b^5$

27) $-18n^5 + 3n^3 - 21n - 9$

28) $30a^8 + 6a^5 + 27a^3 + 21a^2$

29) $-40x^{11} - 20x^{12} + 50x^{13} - 50x^{14}$

30) $-24x^6 - 4x^4 + 12x^3 + 8x^2$

31) $-3x^3y + 9x^2y + 2x + 4$

32) $4a^2b^3 + 4a^2b - 7a - 8$

33) $-32mn^8 + 4m^6n + 12mn^4 + 16mn$

34) $-x^3y^6 - 10x^4y - 9y^2 + 9$

35) $-10y^7 + 6y^{10} - 4y^{10}x - 8y^8x$

Answers to Greatest Common Factor

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|-----------------------------------|---------------------------------------|-----------------------------------|----------------------------|
| 1) $9 + 8b^2$ | 2) $x - 5$ | 3) $5(9x^2 - 5)$ | 4) $1 + 2n^2$ |
| 5) $7(8 - 5p)$ | 6) $10(5x - 8y)$ | 7) $7ab(1 - 5a)$ | 8) $9x^2y^2(3y^3 - 8x)$ |
| 9) $3a^2b(-1 + 2ab)$ | 10) $4x^3(2y^2 + 1)$ | 11) $-5x^2(1 + x + 3x^2)$ | 12) $8n^5(-4n^4 + 4n + 5)$ |
| 13) $10(2x^4 - 3x + 3)$ | 14) $3(7p^6 + 10p^2 + 9)$ | 15) $4(7m^4 + 10m^3 + 2)$ | |
| 16) $2(-5x^4 + 10y^2 + 6x)$ | 17) $5(6b^9 + ab - 3a^2)$ | 18) $3y^2(9y^5 + 4x + 3)$ | |
| 19) $-8a^2b(6b + 7a + 7a^3)$ | 20) $5(6m^6 + 3mn^2 - 5)$ | 21) $5x^3y^2z(4x^5z + 3x^2 + 7y)$ | |
| 22) $3(p + 4q - 5q^2r^2)$ | 23) $10(5x^2y + y^2 + 7xz^2)$ | 24) $10y^4z^3(3x^5 + 5z^2 - x)$ | |
| 25) $5q(6pr - p + 10)$ | 26) $7b(4 + 2b + 5b^2 + b^4)$ | 27) $3(-6n^5 + n^3 - 7n - 3)$ | |
| 28) $3a^2(10a^6 + 2a^3 + 9a + 7)$ | 29) $10x^{11}(-4 - 2x + 5x^2 - 5x^3)$ | 30) $4x^2(-6x^4 - x^2 + 3x + 2)$ | |
| 31) $-3x^3y + 9x^2y + 2x + 4$ | 32) $4a^2b^3 + 4a^2b - 7a - 8$ | 33) $4mn(-8n^7 + m^5 + 3n^3 + 4)$ | |
| 34) $-x^3y^6 - 10x^4y - 9y^2 + 9$ | 35) $2y^7(-5 + 3y^3 - 2xy^3 - 4xy)$ | | |