

Name:

Date:

WORKSHEET :



**LCM, GCF of Variable
Terms**

Find the LCM and GCF of the following terms:

	<u>LCM</u>	<u>GCF</u>
1) y y^2 y^3		
2) x^2y $9x$ $8x^3$		
3) x^2y $2xy$ $8yx^2$		
4) $9x^5yz$ $30yx$ $24zx^3$		
5) 21 $9x$ $3y$		
6) 15 24 $25x$		
7) $12a^3b^5$ $9a^2b^2c^2$ $8ab$		
8) $50a^2c$ $125x$ $225ax^3$		

ANSWERS :



LCM, GCF of Variable Terms

Find the LCM and GCF of the following terms:

				<u>LCM</u>	<u>GCF</u>
1)	y	y^2	y^3	y^3	y
2)	x^2y	9x	$8x^3$	$72yx^3$	x
3)	x^2y	2xy	$8yx^2$	$8yx^2$	2yx
4)	$9x^5yz$	30yx	$24zx^3$	$360yzx^5$	3x
5)	21	9x	3y	$63xy$	3
6)	15	24	25x	$600x$	1
7)	$12a^3b^5$	$9a^2b^2c^2$	8ab	$72a^3b^5c^2$	ab
8)	$50a^2c$	125x	$225ax^3$	$2,250a^2x^3c$	25

KEY CONCEPTS:

Learn to find the LCM and GCF of terms with variables and numerical values.

1. The approach is analogous to previous lessons even in the case of variables. First, find the prime factorization and that can be completed as follows with variables

- Reduce numbers and variable terms into their most basic building blocks i.e. to the point where they cannot be factored any further.
- For numbers like 24 that is $= 2^3 \cdot 3$
- For variables like x^2y^3 that is $= x \cdot x \cdot y \cdot y \cdot y$.

2. GCF

- Find the prime factorization of every term.
- Include only the common factors of the prime factorizations including only common variables. If expressed as exponents, this also means use the lowest exponent for common factors even for variables.

$$\begin{aligned} \text{e.g GCF}(15yx^3, 24y^2x^2z) \\ \text{Prime Factorization:} \\ 15yx^3 &= 3 \cdot 5 \cdot y \cdot x \cdot x \cdot x \\ 24y^2x^2z &= 2^3 \cdot 3 \cdot y \cdot y \cdot x \cdot x \cdot z \end{aligned}$$

$$\text{GCF} = 3 \cdot y \cdot x \cdot x = 3yx^2$$

Note only 3 is common among numerical prime factors and only 1 y and 2 x's are common among the variables

3. LCM

- Find the prime factorization of every term.
- Include all distinct factors of the prime factorizations including all distinct variables. Raise each prime factor (including distinct variables) to the highest appearing exponent.

$$\begin{aligned} \text{e.g LCM}(15yx^3, 24y^2x^2z) \\ \text{Prime Factorization:} \\ 15yx^3 &= 3 \cdot 5 \cdot y \cdot x^3 \\ 24y^2x^2z &= 2^3 \cdot 3 \cdot y^2 \cdot x^2 \cdot z \end{aligned}$$

$$\text{LCM} = 2^3 \cdot 3 \cdot 5 \cdot y^2 \cdot x^3 \cdot z = 120y^2x^3z$$

Note the distinct numerical prime factors are 2, 3, and 5 and each is raised to the highest appearing power. The distinct variables are x, y, z and each is raised to the highest appearing power.