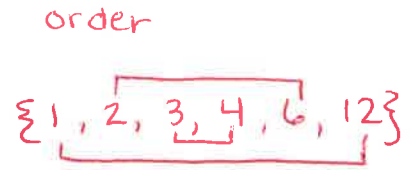


Factors and Greatest Common Factors (GCF)

Factors – Numbers that are multiplied to find a product

What are the factors of 12? 6, 2 3, 4 12, 1



What are the factors of 112? 4, 28 2, 56 112, 1 16, 7, 8, 14

Prime Factorization – the prime factors of a number **USE factor trees!*

Ex 1 ☺ Write the prime factorization of each number. *List prime factors from least to greatest*

a.) 60

$2^2 \cdot 3 \cdot 5$

b.) 33

$3 \cdot 11$

c.) 19

19

Greatest Common Factor (GCF) – The greatest factor that is shared by two or more monomials; greatest number and/or lower exponent on like variable

*- List all prime factors
- Circle the ones in common*

Ex 2 ☺ Find the GCF of each pair of numbers and/or monomials.

a.) 24 and 60

24: $2 \cdot 2 \cdot 2 \cdot 3$
60: $2 \cdot 2 \cdot 3 \cdot 5$
GCF: $2 \cdot 2 \cdot 3$
 12

b.) 18 and 27

18: $2 \cdot 3 \cdot 3$
27: $3 \cdot 3 \cdot 3$
GCF: $3 \cdot 3 = 9$

c.) 12 and 15

12: $2 \cdot 2 \cdot 3$
15: $3 \cdot 5$
GCF: 3

d.) x^2 and x^5

GCF: $x \cdot x = x^2$

e.) x^2y^2 and xy

GCF: xy

f.) x^3y^5z and x^4y^5

GCF: x^3y^5

** z is not a common factor so it is not included in the GCF*

** lowest exponent on common variable!*

GCF: Find coefficients, then variable

g.) $3x^3$ and $6x^2$

h.) $4a^4$ and $10a^8$

i.) $3x^2$ and $5y^2$

GCF: $3x^2$

GCF: $2a^4$

GCF: 1

*No GCF: nothing in common

Least Common Multiple (LCM) - the lowest number that each number divides into evenly; lowest number and/or highest exponent on ~~like~~ every variable **Must include every factor*

Ex 4 Find the LCM of each pair of monomials.

a.) 3 and 9

3 $3 \cdot 3$
 3^2 *highest power

LCM: $3^2 = 9$

b.) 15 and 25

$3 \cdot 5$ $5 \cdot 5$
 $(3 \cdot 5)$ (5^2)

LCM: $3 \cdot 5^2$
 $3 \cdot 25$
 75

c.) 14 and 49

$2 \cdot 7$ $7 \cdot 7$
 $2 \cdot 7$ 7^2

LCM: $2 \cdot 7^2$
 $2 \cdot 49$
 98

d.) $4x$ and $8x^2$

2^2 2^3

LCM: $2^3 x^2$
 $8x^2$

e.) $20a^3$ and $30a^5$

$2 \cdot 2 \cdot 5 \cdot a^3$ $2 \cdot 3 \cdot 5 \cdot a^5$
 $2^2 \cdot 5 \cdot a^3$ $2 \cdot 3 \cdot 5 \cdot a^5$

LCM: $2^2 \cdot 3 \cdot 5 \cdot a^5$
 $60a^5$

f.) $4x$ and $12y$

LCM: $12xy$

g.) $3x^2y$ and $4xy^2$

LCM: $3 \cdot 4 x^2 y^2$
 $12x^2y^2$

h.) $9a^2b^2$ and $5ab^3$

LCM: $9 \cdot 5 a^2 b^3$
 $45a^2b^3$

i.) $16a^2$ and $20b^2$

2^4 $2^2 \cdot 5$

LCM: $80a^2b^2$

GCF → one of each common factor to the lowest power
LCM → one of every factor to the highest power

Practice ☺ Find the GCF and the LCM of each pair of numbers and/or monomials.

1.) 12 and 60

$$\begin{array}{c} 3 \wedge 4 \\ 2 \wedge 2 \end{array} \quad \begin{array}{c} 6 \wedge 10 \\ 2 \wedge 3 \end{array} \quad \begin{array}{c} 2 \wedge 5 \end{array}$$
$$2^2 \cdot 3 \quad 2^2 \cdot 3 \cdot 5$$

GCF: $\boxed{12}$
LCM: $\boxed{60}$

2.) 28 and 49

$$\begin{array}{c} 2 \wedge 14 \\ 2 \wedge 7 \end{array} \quad \begin{array}{c} 7 \wedge 7 \end{array}$$
$$2^2 \cdot 7 \quad 7^2$$

GCF: $\boxed{7}$
LCM: $2^2 \cdot 7^2 = \boxed{196}$

3.) $13w^3$ and $2w^2$

GCF: $\boxed{w^2}$
LCM: $\boxed{26w^3}$

4.) $9y$ and $63y^3$

$$3^2 \quad 3^2 \cdot 7$$

GCF: $\boxed{9y}$
LCM: $\boxed{63y^3}$

5.) $15r^5$ and $7r^4$

$$3 \cdot 5 \quad 7$$

GCF: $\boxed{r^4}$
LCM: $\boxed{105r^5}$

6.) $20m^4$ and $10n^3$

$$2^2 \cdot 5 \quad 2 \cdot 5$$

GCF: $\boxed{10}$
LCM: $\boxed{20m^4n^3}$

network:

