

Greatest Common Factor

- GCF

- As small as or smaller than the smallest number given in the question
- You can list all of the factors and find the biggest one they have in common
- Take all the variables they have in common to the SMALLEST exponent given in the question

Ex. 1) GCF

$$6x^2yz^4 \quad 30x^4y$$

What is the greatest common factor (GCF) of the monomials shown above?

$$\begin{array}{r} 6 \\ \hline 1 \cdot \textcircled{6} \\ 2 \cdot 3 \end{array}$$

$$\begin{array}{r} 30 \\ \hline 1 \cdot 30 \\ 2 \cdot 15 \\ 3 \cdot 10 \\ 5 \cdot \textcircled{6} \end{array}$$

$$\boxed{\text{GCF} = 6x^2y}$$

Exponents they
have in common
with smallest
exponent

Ex. 2 GCF

$$3x^2y^4 \quad 33xy^2$$

What is the greatest common factor (GCF) of the monomials shown above?

- A. $3xy^2$
- B. $33x^2y^4$
- C. $33x^3y^6$
- D. $3x^2y^4$

$$\begin{array}{r} 3 \\ 1 \cdot \textcircled{3} \end{array} \quad \begin{array}{r} 33 \\ 1 \cdot 33 \\ \textcircled{3} \cdot 11 \end{array}$$

$$\text{GCF} = 3xy^2$$

Ex. 4) GCF

$$6x^4y^4 \quad 30x^4y^4 \quad 6x^5y^5$$

What is the greatest common factor (GCF) of the monomials shown above?

$$\begin{array}{r} 6 \\ 2 \cdot \textcircled{3} \end{array} \quad \begin{array}{r} 30 \\ 1 \cdot 30 \\ 2 \cdot 15 \\ 3 \cdot 10 \\ 5 \cdot \textcircled{6} \end{array} \quad \begin{array}{r} 6 \\ 1 \cdot \textcircled{6} \\ 2 \cdot 3 \end{array}$$

$$\boxed{\text{GCF} = 6x^4y^4}$$

Ex. 3) GCF

$$21x^3y^4 \quad 6x^2y^2 \quad 3x^4y^3$$

What is the greatest common factor (GCF) of the monomials shown above?

$$\begin{array}{r} 21 \\ 1 \cdot 21 \\ \textcircled{3} \cdot 7 \end{array} \quad \begin{array}{r} 6 \\ 1 \cdot 6 \\ 2 \cdot \textcircled{3} \end{array} \quad \begin{array}{r} 3 \\ 1 \cdot \textcircled{3} \end{array}$$

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

GCF

Ex. 5)

$$78x^3y^2 \quad 30x^4y^2$$

What is the greatest common factor (GCF) of the monomials shown above?

$$\begin{array}{r} 78 \\ 1 \cdot 78 \\ 2 \cdot 39 \\ 3 \cdot 26 \\ \textcircled{6} \cdot 13 \end{array} \quad \begin{array}{r} 30 \\ 1 \cdot 30 \\ 2 \cdot 15 \\ 3 \cdot 10 \\ 5 \cdot \textcircled{6} \end{array}$$

$$\boxed{\text{GCF} = 6x^3y^2}$$

Ex. 6)

$$52x^2y^4z^4 \quad 20xy^4z^2$$

What is the greatest common factor (GCF) of the monomials shown above?

$$\begin{array}{r} 52 \\ 1 \cdot 52 \\ 2 \cdot 26 \\ \textcircled{4} \cdot 13 \end{array} \quad \begin{array}{r} 20 \\ 1 \cdot 20 \\ 2 \cdot 10 \\ \textcircled{4} \cdot 5 \end{array}$$

$$\boxed{\text{GCF} = 4xy^4z^2}$$

Ex. 7)

The greatest common factor (GCF) of $x^{2k}y^6$ and x^7y^k is x^7y^4 . What is the value of k ?

- A. $1 = k$
- ☒ B. $4 = k$
- C. $8 = k$
- D. $20 = k$

<u>A</u> $k=1$ $x^{2 \cdot 1}y^6$ and x^7y^1 x^2y^6 and x^7y $GCF = x^2y$ X	<u>B</u> $k=4$ $x^{2 \cdot 4}y^6$ and x^7y^4 x^8y^6 and x^7y^4 $GCF = x^7y^4$ ✓
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Ex. 8) LCM

Look at the two monomials below.

$$27x^3y^2 \quad 15x^3y^4$$

What is the least common multiple (LCM) of the monomials shown above?

$$27 \rightarrow 27, 54, 81, 108, \textcircled{135}$$

$$15 \rightarrow 15, 30, 45, 60, 75, 90, 105, 120, \textcircled{135}$$

$$LCM = 135x^3y^4$$

All variables. Biggest exponents.

Least Common Multiple

• LCM

- This number is as big as or bigger than the biggest number given in the question
- You can multiply the numbers and finding the smallest one they have in common
- Take all of the variables to the BIGGEST exponent

Ex. 9) LCM

Look at the two monomials below.

$$108u^2v^4w^2 \quad 60u^4v^4w^3$$

What is the least common multiple (LCM) of the monomials shown above?

- A. $12u^6v^8w^5$
- B. $12u^2v^4w^2$
- C. $540u^6v^8w^5$
- ☒ D. $540u^4v^4w^3$

$$12 \div 108 = 0.1$$

$$540 \div 108 = 5$$

$$540 \div 60 = 9$$

$$LCM = 540u^4v^4w^3$$

LCM variables
 $u^4v^4w^3$

Ex. 10) LCM

Look at the three monomials below.

$$12x^3y^2z \quad 20x^4y^3z^3 \quad 20x^3y^2$$

What is the least common multiple (LCM) of the monomials shown above?

$$12 \rightarrow 12, 24, 36, 48, \textcircled{60}$$

$$20 \rightarrow 20, 40, \textcircled{60}$$

$$\boxed{\text{LCM} = 60x^4y^3z^3}$$

Ex. 11) LCM

Look at the three monomials below.

$$108x^2y^3z^2 \quad 60x^2y^3z^4 \quad 20xy^2z$$

What is the least common multiple (LCM) of the monomials shown above?

A. ~~$12x^2y^3z^2$~~

B. ~~$12x^2y^3$~~

C. ~~$540x^4y^6z^6$~~

D. $\textcircled{540x^2y^3z^4}$

LCM var.

$$x^2y^3z^4$$

$$108 \rightarrow 108, 216, 324, 432, 540, 648, 756, 864, 972, 1080$$

$$60 \rightarrow 60, 120, 180, 240, 300, 360, 420, 480, 540, 600, 660, 720, 780, 840, 900, 960, 1020, 1080$$

$$20 \rightarrow 20, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, 700, 720, 740, 760, 780, 800, 820, 840, 860, 880, 900, 920, 940, 960, 980, 1000, 1020, 1040, 1060, 1080$$