

Greatest Common Factor

Factors - Numbers that divide evenly into a number.

$$\begin{array}{l} \underline{2} \\ 1 \cdot 2 \end{array} \quad \begin{array}{l} \underline{12} \\ 1 \cdot 12 \\ 2 \cdot 6 \\ 3 \cdot 4 \end{array} \quad \begin{array}{l} \underline{25} \\ 1 \cdot 25 \\ 5 \cdot 5 \end{array}$$

Greatest Common Factor (GCF) - The greatest factor that two or more numbers have in common.

$$\begin{array}{l} \underline{12} \\ 1 \cdot 12 \\ 2 \cdot \textcircled{6} \\ 3 \cdot 4 \end{array} \quad \begin{array}{l} \underline{18} \\ 1 \cdot 18 \\ 2 \cdot 9 \\ 3 \cdot \textcircled{6} \end{array} \quad \text{GCF} = 6$$

Relatively Prime - Two or more numbers are relatively prime if their GCF is 1.

$$\begin{array}{l} \underline{12} \\ \textcircled{1} 12 \\ 2 \cdot 6 \\ 3 \cdot 4 \end{array} \quad \begin{array}{l} \underline{25} \\ \textcircled{1} 25 \\ 5 \cdot 5 \end{array} \quad \text{GCF} = 1$$

Directions: Find the greatest common factor.

1. 12, 33

$$\begin{array}{r} \underline{12} \\ 1 \cdot 12 \\ 2 \cdot 6 \\ \textcircled{3} \cdot 4 \end{array}$$

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

$$\boxed{\text{GCF} = 3}$$

2. 54, 60

$$\begin{array}{r} \underline{54} \\ 1 \cdot 54 \\ 2 \cdot 27 \\ 3 \cdot 18 \\ \textcircled{6} \cdot 9 \end{array}$$

$$\begin{array}{r} \underline{60} \\ 1 \cdot 60 \\ 2 \cdot 30 \\ 3 \cdot 20 \\ 4 \cdot 15 \\ 5 \cdot 12 \\ \textcircled{6} \cdot 10 \end{array}$$

$$\boxed{\text{GCF} = 6}$$

3. 72, 224

$$\begin{array}{r} \underline{72} \\ 1 \cdot 72 \\ 2 \cdot 36 \\ 3 \cdot 24 \\ 4 \cdot 18 \\ 6 \cdot 12 \\ \textcircled{8} \cdot 9 \end{array}$$

$$\begin{array}{r} \underline{224} \\ 1 \cdot 224 \\ 2 \cdot 112 \\ 4 \cdot 56 \\ 7 \cdot 32 \\ \textcircled{8} \cdot 28 \\ 14 \cdot 16 \end{array}$$

$$\boxed{\text{GCF} = 8}$$

4. 48, 92, 120

48
1·48
2·24
3·16
④12
6·8

92
1·92
2·46
④23

120
1·120
2·60
3·40
④30
5·24
6·20
8·15
10·12

GCF = 4

5. $54x^2$, $60x^3$

$x^{\textcircled{2}}$ x^3

54
1·54
2·27
3·18
⑥9

60
1·60
2·30
3·20
4·15
5·12
⑥10

GCF = $6x^2$

6. $16x^2y^3$, $36xy^4$

$x^2y^{\textcircled{3}}$ $x^{\textcircled{1}}y^4$

16
1·16
2·8
④4

36
1·36
2·18
3·12
④9
6·6

GCF = $4x^1y^3$

GCF = $4xy^3$

7. $8m$, 28

$$\begin{array}{r} 8 \\ 1 \cdot 8 \\ 2 \cdot 4 \end{array}$$

$$\begin{array}{r} 28 \\ 1 \cdot 28 \\ 2 \cdot 14 \\ 4 \cdot 7 \end{array}$$

$$\boxed{\text{GCF} = 4}$$

8. mn^2 , m^3n , mn^3

$$\begin{array}{ccc} m^0 n^2 & m^3 n^1 & m^1 n^3 \\ \uparrow & \uparrow & \uparrow \end{array}$$

$$\text{GCF} = m^1 n^1$$

$$\boxed{\text{GCF} = mn}$$