

## Prime Numbers

When a factor of a number has exactly 2 divisors, it itself

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

## Composite Numbers

Not prime

4, 6, 8, 9, 12, 14, 15, 16, 18, 20, 21, 22, 24, 25, 26, 27

Factors of 12: 1, 2, 3, 4, 6, 12

Prime factors of 12: 2, 3

Factors of 75: 75  
^  
3 x 25  
^  
5 x 5

$$75 = 3 \times 5 \times 5$$

$75 = 3 \times 5^2 \rightarrow$  Exponential notation (Powers)

12  
^  
2 x 6  
^  
2 x 3

$$12 = 2 \times 2 \times 3$$

$$12 = 2^2 \times 3$$

## Prime Factorization

Prime Factors of 48

48  
^  
2 ~~24~~  
^  
2 x 12  
^  
2 x 6  
^  
2 x 3

$$48 = 2 \times 2 \times 2 \times 2 \times 3$$

24 x 3

3300  
^  
33 x 100  
^   ^  
3 x 11   2 x 50  
^  
2 x 25  
^  
5 x 5

$$3300 = 2 \times 2 \times 3 \times 5 \times 5 \times 11$$

$$2^2 \times 3 \times 5^2 \times 11$$

9

9

9

# GCF - Greatest Common Factor

○ GCF - greatest factor the numbers have in common

GCF (8, 12)

8: 1, 2, 4, 8

12: 1, 2, 3, 4, 6, 12

$$\boxed{\text{GCF}(8, 12) : 4}$$

8	12
∧	∧
2x4	2x6
∧	∧
2x2	2x3

8: 2x2x2

12: 2x2x3

$$2 \times 2 = 4$$

$$\text{GCF}(8, 12) : 4$$

GCF(24, 30)

24: 1, 2, 3, 4, 6, 8, 12, 24

30: 1, 2, 3, 5, 6, 10, 15, 30

$$\boxed{\text{GCF}(24, 30) : 6}$$

24	30
∧	∧
2x12	2x15
∧	∧
2x6	3x5
∧	
2x3	

24: 2x2x2x3

30: 2x3x5

$$2 \times 3 = 6$$

$$\text{GCF}(24, 30) : 6$$

# GCF(138, 198)

138: 1, 2, 3, 6, 23, 46, 69, 138

198: 1, 2, 3, 6, 9, 11, 18, 22, 33, 66, 99, 198

138  
^  
2x69  
^  
3x23

198  
^  
2x99  
^  
3x33

138: 2x3x23  
198: 2x3x33

GCF(138, 198): 6

# GCF(84, 36)

84: 1, 2, 3, 4, 6, 7, 12, 14, 21, 28, 42, 84

36: 1, 2, 3, 4, 6, 9, 12, 18, 36

84  
^  
2x42  
^  
2x21  
^  
3x7

36  
^  
2 18  
^  
2x9  
^  
3x3

Show on the calculator

Math → Num → # 9

GCD (#, #)

84: 2x2x3x7  
36: 2x2x3x3

2x2x3 = 12

GCF(84, 36): 12

# LCM - Least Common Multiple

LCM - the smallest number that is evenly divisible by each number

\* LCM (2, 3)

$$2: 2 \times 1$$

$$3: 3 \times 1$$

← highest power of each prime number

$$2 \times 3 = 6$$

$$\text{LCM} = 6$$

\* LCM (6, 10)

$$6 \\ \wedge \\ 2 \times 3$$

$$10 \\ \wedge \\ 2 \times 5$$

6:  $2 \times 3$  ← use only once

10:  $2 \times 5$

↓  
 $2 \times 3 \times 5 = 30$

$$\text{LCM} = 30$$

\* LCM: (18, 20)

$$18 \\ \wedge \\ 2 \times 9 \\ \wedge \\ 3 \times 3$$

$$20 \\ \wedge \\ 2 \times 10 \\ \wedge \\ 2 \times 5$$

18:  $2 \times 3 \times 3$

20:  $2 \times 2 \times 5$

↓  
 $2 \times 2 \times 3 \times 3 \times 5$  OR  $2^2 \times 3^2 \times 5 = 180$

$$\text{LCM} = 180$$

\* LCM: (15, 25, 30)

$$\begin{array}{c} 15 \\ \wedge \\ 3 \times 5 \end{array}$$

$$\begin{array}{c} 25 \\ \wedge \\ 5 \times 5 \end{array}$$

$$\begin{array}{c} 30 \\ \wedge \\ 5 \times 6 \\ \wedge \\ 2 \times 3 \end{array}$$

$$15: 3 \times 5 \rightarrow 3 \times 5$$

$$25 = 5 \times 5 \rightarrow 5^2$$

$$30 = 2 \times 3 \times 5 \rightarrow 2 \times 3 \times 5$$

$$2 \times 3 \times 5 \times 5 \rightarrow 2 \times 3 \times 5^2 = 150$$

15: 15, 30, 45, 60, 75, 90, 105, 120, 135, 150

25: 25, 50, 75, 100, 125, 150

30: 30, 60, 90, 120, 150

Show on the calculator

Math  $\rightarrow$  Num  $\rightarrow$  #8

LCM (#, #)

LCM(15, 25, 30)

① LCM(15, 25)

75

② LCM(25, 30)  
150

③ LCM(75, 150)  $\rightarrow$  150