

### Quick Arithmetic Summary

1. **Integers** can be positive and negative  
 $\{-\infty \dots \dots, -3, -2, -1, 0, 1, 2, 3 \dots \dots \infty\}$
2. **Zero** is an even integer
3. **Adding and subtracting numbers:**  
Same signs you add and keep the sign  
 $-3 - 5 = -8; \quad 3 + 5 = 8; \quad -1 - 7 = -8$   
Different signs you subtract and keep sign of the largest number  
 $-12 + 2 = -10; \quad 10 - 2 = 8; \quad -5 + 3 = -2$
4. **Absolute value** of a number is the distance from the number to zero on the number line. In other words, **the absolute value is always positive**  
 $|-3| = 3; \quad |-2 - 3| = |-5| = 5; \quad |-3 + 6| = |3| = 3$   
If there is a negative outside the absolute value, then your result will be negative.  
 $-|-3| = -3; \quad -|-2 - 3| = -|-5| = -5$
5. **Factors divisions** are the numbers that evenly divide a number  
The factors of 6 are : 1, 2, 3, 6  
The factors of 18 are : 1, 2, 3, 6, 9, 18
6. **Multiples** are the results of the multiplication of a number with another number  
The multiples of 2 are : 2, 4, 6, 8, 10, 12, ... ..  
The multiples of 11 are : 11, 22, 33, 44, 55, 66, ... ..

7. **Divisibility Rules:**

Divisible by 2: The last digit is even

4, 6, 8, 10, 200, 312

Divisible by 3: Add the digits, the result must be multiple of 3

51 (5 + 1 = 6 is divisible by 3)

111 (1 + 1 + 1 = 3 is divisible by 3)

801 (8 + 0 + 1 = 9 is divisible by 3)

Divisible by 4: The last two digits is a multiple of 4

832 (32 is a multiple of 4; therefore 832 is divisible by

4)

9044 (44 is a multiple of 4; therefore 9044 is divisible  
by 4)

Divisible by 5: The last digit is five or zero

15, 200, 3035, 1000, 2015

Divisible by 6: The number must be divisible by 2 and 3 at the  
same time.

12  $\Rightarrow$  is divisible by 2 and 3 so it is also divisible by 6

750  $\Rightarrow$  is divisible by 2 and 3 so it is also divisible by 6

8. **Prime Number** is an integer greater than 1 with factors 1 and  
itself.

**1 IS NOT A PRIME NUMBER**

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

2 is the only even prime number

9. **Composite:** Any integer that is not prime  
4, 6, 8, 15, 200, ...

10. **Prime Factorization:** Is the result of multiplying factors that are Prime, like:

$$2, 3, 5, 7, 11$$

The prime factorization of  $120 = 2*2*2*3*5 = 2^3 * 3 * 5$

11. **Least Common Multiple** (LCM) of two nonzero integers is the least positive **multiple** of both numbers.

Find the LCM of 200 and 60

**STEP ONE:** Find the prime factorization

$$200 = 2^3 * 5^2$$

$$60 = 2^2 * 3 * 5$$

**STEP TWO:** Multiply all the **common** and **non-common** factors with the **highest exponent**.

$$2^3 * 5^2 * 3 =$$

$$8 * 25 * 3 = 600$$

Find the LCM of 20 and 30

$$20 = 2^2 * 5$$

$$30 = 2 * 5 * 3$$

$$\text{LCM of 20 and 30} = 2^2 * 5 * 3 = 60$$

12. **Greatest Common Factor** (GCF) of two nonzero integers is the greatest

Positive integer that is a **divisor** of both numbers.

Find the GCF of 60 and 45

**STEP ONE:** First do the prime factorization of 60 and 45

$$60 = 2^2 * 3 * 5$$

$$45 = 3^2 * 5$$

**STEP TWO:** Multiply only the **common** factors with the **lowest exponent**

$$= 3 * 5$$

$$\text{GCF} = 15$$