1/3	.33
2/3	.66
1/6	.16
2/6	.33
5/6	.83
1/5	.2

2/5	.4
3/5	.6
4/5	.8
1/8	.125
2/8	.25
3/8	.375

5/8	.625
6/8	.75
7/8	.875
2^3	8
2^4	16
2^5	32

2^6	64
2^7	128
2^8	256
2^9	512
2^10	1024
3^3	27

3^4	81
4^3	64
4^4	256
5^3	125
5^4	625
6^2	36

7^2	49
8^2	64
9^2	81
10^2	100
11^2	121
12^2	144

13^2	169
14^2	196
15^2	225
16^2	256
17^2	289
18^2	324

19^2	361
20^2	400
$\sqrt{2}$	1.414
$\sqrt{3}$	1.732
$\sqrt{64}$	8
$\sqrt{121}$	11

$\sqrt{144}$	12
$\sqrt{225}$	15
$\sqrt{400}$	20
$\sqrt{289}$	17
$\sqrt{324}$	18
$\sqrt{625}$	25

$\sqrt{900}$	30
$\sqrt{1024}$	32
Real Numbers	all numbers on the number line
Rational numbers	All numbers that can be expressed as the ratio of two integers (all integers and fractions)
Irrational Numbers	all real numbers that are not rational, both positive and negative (e.g. Pi and $\sqrt{-x}$
commutative law	Doesn't matter in what order operation is performed - Addition - Multiplication

Associative law	Terms can be regrouped with parenthesis without changing the result
Distributive law	allow to distribute a factor among terms being added or subtracted $a(b+c) = ab + ac$
Adding or subtracting fractions	have to have a common denominator
LCD	Least common denominator is the least common multiple of the denominator.
Multiplying fractions	just mulitply top and bottom, but you can reduce the fractions diagonally first if possible
Compare fractions	Cross multiply to see which one is larger. Product relates to the one with numerator. So start with the numerator on the left.

First 25 prime numbers	2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89,97
Only even prime number?	2
Divisible by 2	Last digit is an even number> 0,2,4,6,8
Divisible by 3	Sum of all the digits is divisible by 3
Divisible by 4	last two digits of number are divisible by 4
Divisible by 5	0 or 5

divisible by 6	Divisible by 2 and 3 - sum of all the digits is divisible by 3, and the last digit is zero or an even number
Divisible by 7	double the value of the last digit and subtract the result from the rest of the number. Th answer is divisible by 7? 385 38-(2x5) = 28 28/7 = 4
Divisible by 8	Can be divided by 2 evenly 3 times - last 3 digits are divisible by 8?
Divisible by 9	sum of all the digits of the number is divisible by 9
LCM/LCD using prime factorization	ELIMINATE DUPLICATES and LEAVE HIGHEST POWER. Break down the numbers into prime factorization, then eliminate duplicates and leave only duplicates to the highest power, multiply together and you get the LCM/LCD
GCF	OVERLAP. Greatest common factor. The greatest integer that divides with no remainder into two or more given integers. Break down into prime factorization and then find the overlap.

Divide fractions?	multiply by the reciprocal
um of all positive integers up to and including 99	(1+99)/2 = 50 so you got the average of all numbers up to and including 99 Then you can multiply but number of numbers... 99 99*50 = 4950
Number of 3 digit numbers?	999-100+1=900
Addition Odd and Even number behaviour?	Odd + Odd = EVEN Even +Even =EVEN Odd +Even = Odd
Subtraction Odd and Even number behaviour	Even - Odd = Odd Even - Even = Even Odd -Even = Odd Odd - Odd =Even
Multiplication of odds and evens	Even * Even = Even Even * Odd = Even Odd* Odd = Odd

Divisible by 12	Divisible by 4 and by 3
Divisible by 15	Divisible by 5 and 3
Solving quadratic equation k^2 - 8k + 15 = 0	Find what two numbers multiply to 15 and add to -8. so must be -5 and -3. So factor it out into (k-5)(k-3) =0 so k can be either 5 or 3
DS - if one of the statements is equal to the one in the prompt then it confirms that the statement in the prompt is true. i.e. if it is a dependent formula then it doesn't help to solve for additional variables but will confirm that a statement is true. So if they say solve for x then it might not help but if they say does kx=4 - mx and one of the statments is a dependent formula then it will help	
If you add two numbers that have the same factor	The resulting number will also be divisible by that number
Pythagorean triples - 3 main ones	3-4-5 (and multiples, e.g. 6-8-10), 5-12-13, 7-24-25

Pythagorean triples	3-4-5, 5-12-13, 7-24-25, 8-15-17 (The longest side is of course the one opposite the 90 degree angle)
Special right triangles 45-45-90	The sides are proportional as x-x-x (sqroot2)
Special right trianlge 60-30-90	The sides are proportional as x-x (sqroot3)-2x (the x is opposite the 30)
Split an equilateral triangle into 2?	you get 2 30-60-90 triangles!
If you have 2 of the following points you can solve for the rest	1. Length side 1 2. Length side 2 3. Length hypothenuse or Diagonal of the square 4. Area 5. Perimeter
30/360	1/12

60/360	1/6
90/360	3/12 or 1/4
120/360	4/12 or 1/3
210/360	7/12
240/260	8/12 or 2/3
45/360	1/8

90/360	2/8 or 1/4
135/360	3/8
180/360	1/2
225/360	5/8
Area of a sphere	4/3 Pi r^3
Surface area of a sphere	4 pi r^2

Formula to find sum of angles in a shape??	(n-2) x 180 where n is the number of sides. Or you can count the triangles you can form within the shape and multiply by 180
Properties of a parallelogram	one pair of parallel sides and those sides are equal in length, if sides weren't equal in length would be a trapezoid.
What to do when you are solving an equation with absolute value and a variable outside of the absolute value sign?	e.g. |x+4| = 4x+3 you need to first solve for two answers, positive and negative 4x+3, but then TEST BOTH ANSWERS, it could be that one doesn't work, this is key, especially for data sufficiency problems.
is 0 an integer?	yes
If question says sum of two primes is odd	Then one of them must be 2, because all other primes are odd and O + O = E. so only E + O can equal O.
is 0 positive or negative?	neither

Mean and median in consecutive sets?	always equal to each other, and also both are equal to mean of first and last numbers. so you dont even need all the numbers of the set
When counting consecutive integers	ADD ONE BEFORE YOU'RE DONE!
ODD VS EVEN - median/ avg of a set with odd vs. even numbers?	even numbers then median is not an integer, odd elements then integer
The product of k consecutive integers, is always divisible by	k! ... K factorial.
Divisibility of sum of set with odd number of elements?	will be divisible by the number of elements
Divisibility of sum of set with even number of elements	will NOT be divisible by the number of elements. becasue the avg is not an integer if set has even elements. xxxx, no middle number!

1.4^2	2
1.7^2	3
2.25^2	5
30^2	900
25^2	625
If you add a non-multiple of N to a multiple of N =	Non-multiple of N 18 (mult of 3) + 10 = 28 (non-mult of 3)

If you subtract a non-multiple of N from a multiple of N =	Non-multiple of N 30 (mult of 3) - 10 (non mul of 3) =
How many factors does a perfect square have?	an ODD number of factors - because it has one "unpaired" factor which multiplys by itself to give the number, but the factor is only counted once!
How many factors does a non-perfect square have?	an EVEN number of factors - because it always has "paired" factors, 1 and itself, 2 and x, 3 and y etc.
Properties of the prime factorization of perfect squares?	there are only prime factors to even powers! of course because 3 x 3 = 9, so 3^2... and 9 x 9 - (3x3) (3x3) = 3^2 x 3^2 = 3^4
Properties of the prime factorization of a non-perfect square?	have prime factors to odd powers! i.e. may have prime factors to even powers but has one to odd power or all to odd power. Not all are to even power!
How many factors does 2000 have?	solve for prime fact 2^4 x 5^3 and then use counting principle (4+1)(3+1) = 20, the factors could have any combination of 2s, thus could have zero twos, one 2, two 2s, three 2s, or four 2s, so you multiply the possibilities of each factor by each other to get the nmber of possible combinations.

Write an even arbitrary number algebraically?	2n
write an odd arbitrary number algebraically?	2n +1 or 2n -1
formula for change in mean if a new term is added?	distribute the weight of new term to each of total terms. i.e. (new term-average)/new total No. of terms
How many zeros at the end of 60!	Check how many 2s and 5s in the numbers prime factorization, i.e. how many times is it divisible by 10? so will be divisible by same number as lowest power of 2 and 5. (if prim fact contains 2^3 and 5^6 then it is div by 10 3 times). so 60 will be mulitplied by 12 multiples of 5 (5x12=60) and additionally 25 and 50 will have 2 fives in them, as 5x5 is 25 and 5x2x10 is 50. so 12+2=14 zeros!
A line that passes through the origin and point (-a,-a) has a slope of?	1
A point that is reflected over the y=x line?	switch around the x and y points. i.e (2,3) on the other side of the line y=x is (3,2).. equidistant to the line y=x

Divisor	Doesn't mean only prime factors!! it means factors/ divisors, so everything that will go into the number. i.e. for 12 it is 1,2,3,4,6,12
Linear equation of a line	y=mx+b m is the slope and b is the Y intercept!!! so when x is zero, the line crosses the Y axis at B!!
how do you represent two numbers with reversed digits?	10t+s and 10s+t then use these representations to get whatever it is you need
5x6	30
6x6	36
6x7	42

6x8	48
6x9	54
6x12	72
7x6	42
7x7	49
7x8	56

8x7	56
8x8	64
9x8	72
9x9	81
9x12	108
11x12	132

12x12	144
13x12	156
12*13	156
3x9	27
4x9	36
5x9	45

8x5	40
7x5	35
2x9	18
12x9	108
12x5	60
12x7	84

12x4	48
12x8	96