

Contents

Number Properties:	2
Absolute Value:	3
Geometry	4
Coordinate Geometry:	4
Functions and Sequences:	4
Permutations and Combinations:	4
Overlapping sets:	5
Statistics:	5
Rate Problems:	5
Ratios:	5

Data Sufficiency:

- Don't forget to check for option C.
-

Number Properties:

Prime Numbers: 2,3,5,7,11,13,17,19,23,29,31,37,41,43,47,53,59,61,67,71,73,79,83,89,97,101

Division formula:

$$X/y = \text{Quotient} + \text{remainder}/y$$

LCM and GCF:

IF the LCM of x and y is p,

And the GCF of x and y is q,

Then $p \cdot q = x \cdot y$.

Leading Decimals:

If an integer has k digits then the inverse of the integer will have **k-1** leading zeros.

If the integer is a perfect power of 10 then it will have **k-2** leading zeros.

Terminating Decimals:

The decimal equivalent of a fraction will terminate if and only if the denominator of the reduced fraction has a prime factorization that has only 2s or 5s or both.

Ex: $1/20 = .05$. $1/12 = 0.0833333$.

Non Terminating Decimals:

To convert 0.44444 into fraction – you divide the repeating element with 9. (4/9)

To convert 0.2323232323 into fraction – you divide the repeating element by 99. (23/99)

To convert 0.432432432432 into fraction – you divide the repeating element by 999. (432/999)

Perfect Squares:

A number whose prime factors all have even exponents. (Why is this important?)

Perfect Cubes:

A number whose prime factors have exponents divisible by 3.

2 Consecutive integers:

2 Consecutive integers will never share a prime factor. So their GCF is 1.

Perfect cubes: 1,8,27,64,125, 6 - 216, 7 - 343, 8 - 512, 9 - 729 and 1000.

Factorial:

- The factorial of a negative number is undefined.
- The only two odd factorials are 0! And 1!.
- The only factorial which gives a prime number is 2!. $2! = 2$.

Algebra:

If the roots are equal, the discriminant must be zero. $\text{Discriminant} = b^2 - 4ac$.

Absolutely critical for you to check if **the roots are valid**.

Never assume that the roots have to be integers.

For the expression: $X = (x^3 + 6x^2)^{1/4}$.

You will get the roots: 0, 3 and -2.

But x is the 4th root. It CANNOT be negative. So the only valid roots are 0 and 3.

Absolute Value:

$$|a+b| < \text{or} = |a| + |b|$$

When $|a+b| = |a| + |b|$ then either a or b =0. Or a and b are of the same sign. f the same sign.

Subtracting absolute Values:

$$|a-b| > \text{or} = |a| - |b|$$

When $|a-b|=|a|-|b|$ then $b = 0$ or both have the same sign.

Geometry

Area of an equilateral triangle = $s^2 \frac{\sqrt{3}}{4}$

Parallelogram properties: Opposite sides are equal. Opposite angles are equal.

Exterior angles of any polygon sum only to 360 always.

Area of hexagon: $3\sqrt{3}/2 s^2$.

Coordinate Geometry:

Distance = $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

Functions and Sequences:

Sum of the arithmetic sequence: Number of terms*avg of terms = $n \cdot \frac{(a_1+a_n)}{2}$

Geometric sequence: 5,10,20,40

Ratio between every pair of consecutive term is the same. $A_n = a_1 \cdot r^{(n-1)}$

In an evenly spaced set, mean is equal to the median.

Permutations and Combinations:

Read the question really really carefully.

Combinations - Order doesn't matter.

Mug up the permutations formula for indistinguishable terms – just divide $n!$ by number of times each occurs($A! B!$).

Number of ways to organize an item in a circle = $(k-1)!$

Overlapping sets:

Don't forget "Neither" Category in overlapping sets.

Statistics:

How do you find the standard deviation?

Step 1: Find avg of the set.

Step 2: Find the difference between all the numbers and the avg.

Step 3: Square.

Step 4: Add.

Step 5: Take square root.

Rate Problems:

Converging/Diverging Formula: What is it?

Rates are additive. Work is also additive? – $\text{Work}_1 + \text{Work}_2 = \text{Work total}$.

Ratios:

When $x:y = 3:4$

And $x:z = 7:11$ -> you find the combined ratio by finding the LCM between the 2 rows and multiplying accordingly.

$X:y:z = 21:28:33$.