Tips for competetive exams.

CAT, SAT, GMAT, GRE, UPSC, Railways, Defense, Bank PO etc.

- quick calculation
- Accurate estimation of numerical problems.

(In many cases, average time per question - 60 secs.) or so

* Extremely important to develop the skill to quickly tackle questions.

A. Mental calculation of numbers

In school, we are taught to do all calculations from Right to left. (i.e. units place first).

Suppose - 4639 + 1235.

$$\begin{array}{r} 4\ 6\ 3\ 9 \\ +\ 1\ 2\ 3\ 5 \\ \hline \end{array}$$

First you start adding 9/5 & then proceed behind ways. with carry to 3+3 etc.

ON paper, this works fine.

However, It is quicker to start from left to Right.

Keep 4639 in mind.

1235 = 1000 + 200 + 30 + 5

4639 + 1000 = 5639

5639 + 200 = 5839

5839 + 30 = 5869

5869 + 5 = 5874

Q. Subtract 4142 from 7580.

$7580 - 4142 (4000 + 100 + 40 + 2)$

$7580 - 4000 = 3580.$

$3580 - 100 = 3480.$

$3480 - 40 = 3440.$

$3440 - 2 = 3438$

Q. Multiplication - 76×7

$(70+6) \times 7$

$490 + 42$

$490 + (10 + 32)$

$= 532$

83×8

$(80+3) \times 8$

$640 + 24.$

$= 664$

B. Estimation of Square Roots (Imperfect)

This gives a rough estimated value (an idea).

a. Find the square root of 70.

S1: Find a perfect Sq. Root < 70.

i.e. $64. = 8.$
(Sq root)

S2: Divide 70 by 8

i.e. $\frac{70}{8} = 8.75.$

S3: Take average 8.75 & 8

$= 8.37.$

8.37 is the closest Sq. Root of 70.

Q. Find the Square root of 150.

S1: $144. = 12.$

S2: $\frac{150}{12} = 12.5$

S3: Avg. $\frac{12+12.5}{2} = 12.25$

Q. Find the Square root of 8200

S1: Square just below is 8100
$= 90.$

S2: $\frac{8200}{90} = 91.11.$

S3: $\frac{90+91.11}{2} = 90.55$

Average : 75, 72 & 70.

Here pass 2 from 75 to 70.

73, 72, 72

Avg. - 72 → 1 left

$1/3 = 0.33.$

⇒ 72.33

JO quickly arrive at answer.

c. Fractions:

a. Addition of Fractions:

Eg: ① $\frac{3}{5} + \frac{1}{2}$.

$\frac{3}{5} \overset{N}{\times} \frac{1}{2} = \frac{3\times2+5\times1}{10} = \frac{11}{10}$.
D

Eg: ② $\frac{5}{8}$ & $\frac{2}{3}$.

$\frac{5\times3+8\times2}{8\times3} = \frac{15+16}{24} = \frac{31}{24}$

Eg: ③ $\frac{11}{15} + \frac{3}{5}$

$\frac{55+45}{75} = \frac{100}{75} = \frac{4}{3}$.

$\frac{3}{5}\times\frac{3}{3} = \frac{9}{15}$

$\frac{11+9}{15} = \frac{20}{15} = \frac{4}{3}$.

Eg: ④ $\frac{1}{2} + \frac{1}{4} + \frac{3}{5}$.

↓

$\frac{4+2}{8} = \frac{6}{8} = \frac{3}{4}$.

$\frac{3}{4} + \frac{3}{5} \rightarrow \frac{15+12}{20} = \frac{27}{20}$

b. Subtraction of fractions

Q: $\frac{8}{7} - \frac{8}{2}$.

$= \frac{16-56}{14} = \frac{-40}{14} = \frac{-20}{7}$.

2 Numbers - cross method easy.

More than 3 Numbers LCM may be easy.