CSAT- Maths Syllabus

1) Number System
2) LCM & HCF
3) Problems on age
4) Percentage
5) Profit & Loss
6) Average
7) Ratio & Proportion
8) Alligation
9) Partnership
10) Time & work
11) Pipe & cistern
12) Time & distance
13) Problem based on train
14) Boat & stream
15) Race
16) Simple Interest
17) Compound Interest
18) Permutation & Combination
19) Probability
20) Area
21) Volume

Least asked questions

9, 11, 14, 15, 16, 17, 20, 21

Important Chapters

1, 4, 7, 12, 18

CONTENTS

Square [2-30]

$2^2 = 4$	$17^2 = 289$
$3^2 = 9$	$18^2 = 324$
$4^2 = 16$	$19^2 = 361$
$5^2 = 25$	$20^2 = 400$
$6^2 = 36$	$21^2 = 441$
$7^2 = 49$	$22^2 = 484$
$8^2 = 64$	$23^2 = 529$
$9^2 = 81$	$24^2 = 576$
$10^2 = 100$	$25^2 = 625$
$11^2 = 121$	$26^2 = 676$
$12^2 = 144$	$27^2 = 729$
$13^2 = 169$	$28^2 = 784$
$14^2 = 196$	$29^2 = 841$
$15^2 = 225$	$30^2 = 900$
$16^2 = 256$	

Cube [2-30]

$2^3 = 8$	$17^3 = 4913$
$3^3 = 27$	$18^3 = 5832$
$4^3 = 64$	$19^3 = 6859$
$5^3 = 125$	$20^3 = 8000$
$6^3 = 216$	$21^3 = 9261$
$7^3 = 343$	$22^3 = 10648$
$8^3 = 512$	$23^3 = 12167$
$9^3 = 729$	$24^3 = 13824$
$10^3 = 1000$	$25^3 = 15625$
$11^3 = 1331$	$26^3 = 17576$
$12^3 = 1728$	$27^3 = 19683$
$13^3 = 2197$	$28^3 = 21952$
$14^3 = 2744$	$29^3 = 24389$
$15^3 = 3375$	$30^3 = 27000$
$16^3 = 4096$	

Tricks for 101, 1001, 10001

$1001 \times 372 = 372372$

Note: No of zeros = (Number of digits) − 1

→ $10001 \times 9876 = 98769876$

→ $101 \times 12 = 1212$

Q) ABBA × xyz = xyzxyz A:? B:?

A: 1, B: 0 [UPSC-2014]

Q) XYZXYZ is divisible by

A) 37, 7

B) 7, 11

C) 7, 13

D) 7, 11, 13 [UPSC-2024]

We know XYZ × 1001 = XYZXYZ

∴ Answer 1001 = 7 × 11 × 13

Option D

* Square of 11, 111, 1111

$(11)^2 = 121$

$(111)^2 = 12321$

$(1111)^2 = 1234321$

Rule - Count no of 1's
- Write from 1 2 3 ... till the count then reverse it till 1

Q) $(11111111) \times (11111111) =$

* Sum rule in product (LHS : RHS)

- $11 \times 11 = 121$

Sum of digits in LHS - 1+1+1+1 : 4

RHS - 1+2+1 = 4

- $25 \times 25 = 625$

$(2+5) \times (2+5)$ | = 6+2+5

= 7 x 7 | = 13

= 49

: 4+9 = 13

- $3 \times 4 \times 7 \times 8 = 672$

$(3 \times 4) \times (7 \times 8)$ | : 6+7+2 = 15 → 1+5 = 6

= 12 x 56 |

= (1+2) x (5+6) = 3 x 11 → 3 x (1+1) → 3 x 2 = 6

Find the sum of digits of the output [UPSC-2023]

- Total 1's - 9

∴ Output - 123456789 87654321

Sum of digits - 81

Using sum rule in product rule

(11111111) x (11111111)

= 9 x 9

= 81

Memorize the products

- 12345679 x 9 = 111,111,111
  - x18 = 222,222,222
  - x27 = 333,333,333
- 152207 x 73 = 11,111,111

* Divisible trick of 9

$\frac{4}{9} = 0.444444\ldots \rightarrow 0.\overline{4}$

$\frac{6}{9} = 0.66666\ldots \rightarrow 0.\overline{6}$

$\frac{29}{9} = 3.2222\ldots \rightarrow 3.\overline{2}$

$\frac{47}{9} = 5.2222\ldots \rightarrow 5.\overline{2}$

Square Trick $(ab)^2$

$(45)^2$:

1) 4, 5
2) $(5)^2 = 25$
3) $4\times5\times2 = 40+2 = 42$
4) $(4)^2 = 16+4 = 20$

$\therefore 2025$

Rule

1) Split a, b
2) $(b)^2 = b^2$, keep the unit digit, carry the rest
3) $a\times b\times 2 + \text{carry} =$ keep the unit digit, carry the rest
4) $(a)^2 = a^2 +$ carry

$(42)^2 = 2^2 = 4$

$-4\times2\times2 = 16$

$-4\times4 = 16+1 = 17$

$= 1764$

$(63)^2 = 3\times3 = 9$

$-6\times3\times2 = 36$

$-6\times6 = 36+3 = 39$

$\rightarrow 3969$

$(108)^2 = (108)^2 \rightarrow 8\times8 = 64$

$-10\times8\times2 = 160+6 = 166$

$10\times10 = 100+16 = 116$

$\rightarrow 11664$

$(112)^2 = (11\ 2)^2 = 2\times2 = 4$

$11\times2\times2 = 44$

$11\times11 = 121+4 = 125$

$\rightarrow 12544$

$(759)^2 = 9\times9 = 81$

$75\times9\times2 = 1350+8 = 1358$

$75\times75 = 5625+135 = 5760$

$\rightarrow 576081$

* Unit digit sum 10 Multiplication trick

Condition 1 - Both the digits must be same

$$\begin{array}{r} 47 \\ \times 43 \\ \hline \end{array}$$

Condition 2 - Sum of digits = 10

Rule 1) Multiply the unit digit - $7 \times 3 = 21$

2) Add 1 to any matching number - $(4+1) \times 4$

$= 5 \times 4 = 20$

$\therefore 2021$

$$\begin{array}{r} 34 \\ 36 \\ \hline 1224 \end{array} \qquad \begin{array}{r} 85 \\ 85 \\ \hline 7225 \end{array} \qquad \begin{array}{r} 125 \\ 125 \\ \hline 15625 \end{array}$$