

GATE

ALL BRANCHES

General Aptitude



Number System - 2



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TOPICS TO BE COVERED

- 1.
- 2.
- 3.
- 4.

Divisibility Rules

Difference of Twin Prime & Co-Prime

Brainstorming on Numbers

Basic of Next Topic (Calendars)

Previous Session (Revision)



Calculations of Numbers



Finding unit digit

- If base unit digit is
- 0 1 5 6
- Then same
- If base unit digit is
- 4 or 9
- 4 case rep 4 and 6
- 9 case rep 9 and 1

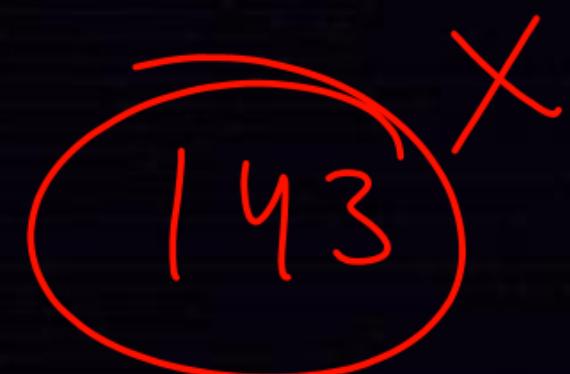
but,

- If base unit digit is
- 2 3 7 8
- 2 case: 2 4 8 6
- 3 case: 3 9 7 1
- 7 case: 7 9 3 1
- 8 case: 8 4 2 6



TWIN PRIME

P
W

143 

11, 13

5, 7

17, 19

3, 5



CO PRIME

P
W

$$\begin{array}{l} \times \\ \checkmark 15 \rightarrow (1) 3, 5, 15 \\ \checkmark 16 \rightarrow (1) 2, 4, 8, 16 \\ \times 16 \rightarrow \underline{(1)} \underline{(2)} 4, 8, 16 \end{array}$$

$$\begin{array}{l} \checkmark 4 \rightarrow (1), 2, 4 \\ \times 18 \rightarrow (1) (2) 3, 6, 9, 18 \\ \checkmark 9 \rightarrow (1) 3, 9 \end{array}$$



Divisibility Rule

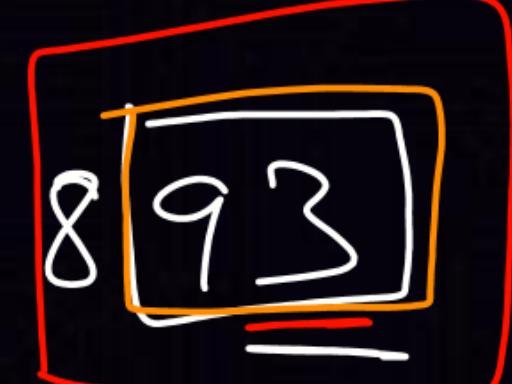
1, < 9, 36, 84 |



DIVISIBILITY RULES

➤ 2:

✓ OR multiple of 2

46 

➤ 3:

✓ OR
Multiple of 3

➤ 4: ✓

✓ OR
Multiple of 4

2 ➤ 0 OR
Multiple of 2.

у

63942

$$6+3+9+4+2 = \underline{\underline{24}}$$



DIVISIBILITY RULES

➤ 5:

$$\cancel{1} \overset{2}{2} \overset{3}{5} \Rightarrow \overset{2}{5}$$

➤ 6:

$$\cancel{\cancel{1}} \cancel{\cancel{2}}$$

➤ 7:

0 OR Multiple
of 5.

00 OR Multiple of 25

$$683 \overline{)94}$$

7

x

1,83,46

18 - 0

= 18 x

1833 ~ 12

18,346 ~ 10

= 182 |

= 18,336

182 ~ 2 = 180

$$12 \rightarrow 3 \times 4$$

~~6~~

$$\textcircled{20} \rightarrow 4 \times 5$$

$$\overbrace{P}^{\text{J}} \times \overbrace{F}^{\text{J}}$$

128938

$$\textcircled{40} \rightarrow 5 \times 8$$



DIVISIBILITY RULES

- 8: ~~Even number~~
- 9: ~~Sum of digits~~
- 10: ~~Last digit is 0~~

3 digit
000 OR multiple of 8

10 @

50

46983



DIVISIBILITY RULES

► 11:

$$3 \times 4$$

X

$$\begin{array}{r} 1283941 \\ \hline \end{array}$$

$$\downarrow \quad \uparrow \quad \uparrow \quad \uparrow$$

$$1 + 8 + 9 + 1 = 19$$

► 12:

~~10~~

$$\begin{array}{r} 19 \\ - 9 \\ \hline 10 \end{array}$$

► 13:

$$\begin{array}{r} 2 + 3 + 4 = 9 \\ \hline \end{array}$$

~~11~~

~~11 83941~~



DIVISIBILITY RULES

$$14 \rightarrow 7 \times 2$$

$$\begin{array}{l} 2 \rightarrow 0, 2 \\ 9 \rightarrow 0, 3, 9 \end{array}$$

► 15: $\cancel{\cancel{0}} \quad 3 \times 5$

► 16: $\cancel{\cancel{00000}} \quad 2^4$ OR Multiple 16

► 18: $\cancel{\cancel{00}} \quad 2 \times 9$



DIVISIBILITY RULES

- 20: 4×5
 $\cancel{2} \cancel{0}$
- 40: 5×8
 $\cancel{4} \cancel{0}$
- 80: 5×16
 $\cancel{8} \cancel{0}$

Q.

Find the remainder when 3^{5193} is divided by 8.

- A. 1
- B. 3
- C. 2
- D. 7

$$\begin{array}{r} 8) \overline{)3^6} \\ \underline{-0} \\ 3 \end{array}$$

$$\begin{aligned} & 3 = 3 \div 8 \quad | \quad R \rightarrow 3 \\ & 3 = 9 \div 8 \quad | \quad R \rightarrow 1 \\ & 3 = 27 \div 8 \quad | \quad R \rightarrow 3 \\ & 3 = 81 \div 8 \quad | \quad R \rightarrow 1 \end{aligned}$$

Q.

If the number $653\overset{vv}{ab}$ is divisible by 90, then $(a + b) = ?$

$a + b$

$b = \underline{0}$

90

18×5

$14 + ? =$

A. 11

B. 13

C. 22

D. 4

$6 + 5 + 3 + a + 0$

9×10

$\frac{4}{=}$

$6 + 5 + 3 + \underline{\quad} + 0$

$\times 13$

$\times 22$

Q.

What is the unit digit of $6^{15} - 7^5 - 9^3$?

A.

5

B.

4

C.

6

D.

9

0
0

6¹⁵

7⁵

9³

9
9
1

9
9
1

6 - 7 - 9

6 - 16

6 - ay7₉

7 - 729

9 - 436
47
89

7¹ = 7
7² = 9
7³ = 3
7⁴ = 1

7⁵ = 7



CALENDARS

SOLAR

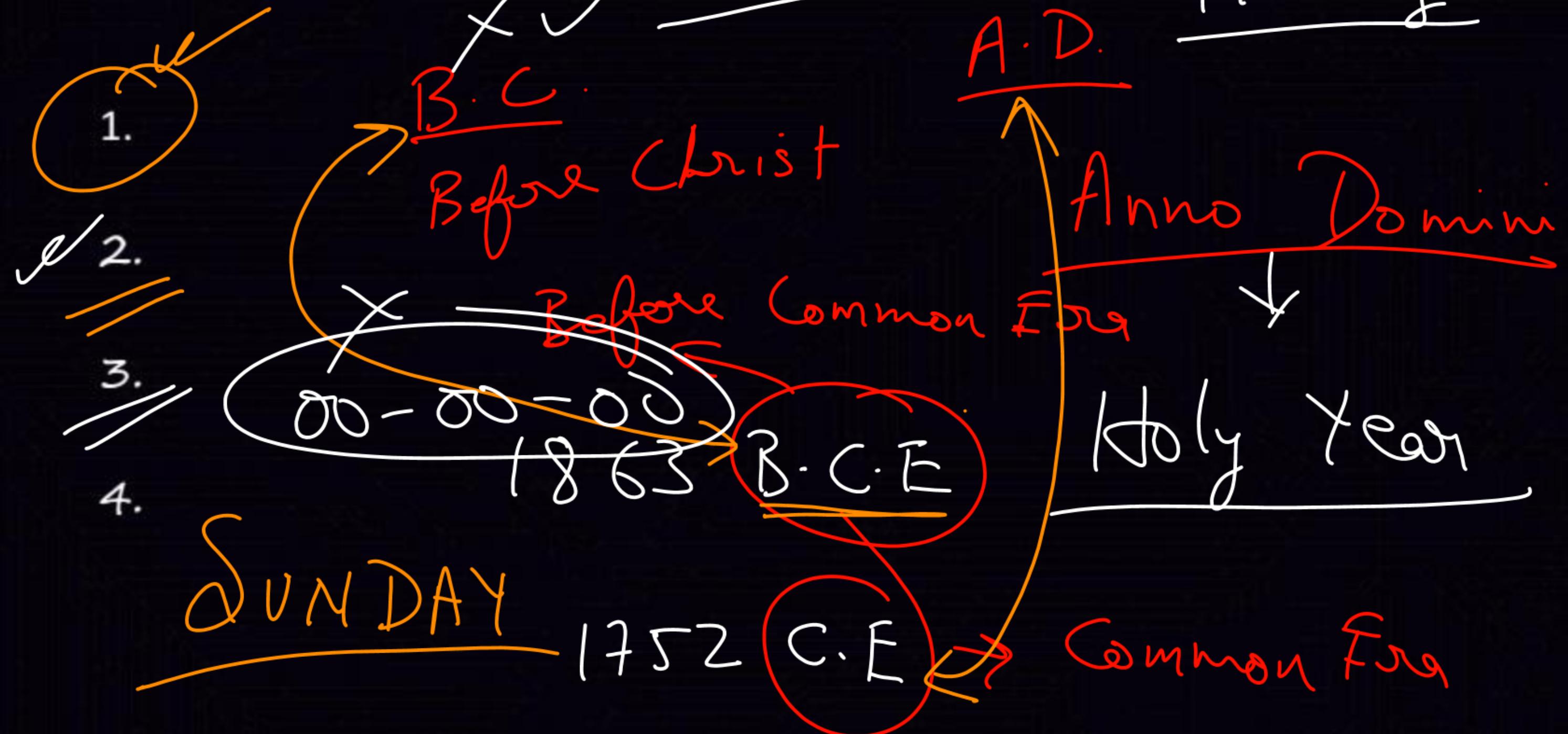
English



Lunar



Basic Questions



~~11 months~~

~~Fe~~

~~ONLY~~

~~9 months~~

✓ April

✓ June

30 days ✓ Sep

✓ Nov

