



Sahi Prep Hai Toh Life Set Hai

DIVISIBILITY RULES

Agenda

- * Theory & Concepts of
Divisibility Rules

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Agenda

* Theory & Concepts of
Divisibility → (45 min - 50 min)

* Practice Q → (50 - 55) min

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Agenda

* Theory & Concepts of
Dirac Rules \rightarrow (45 min - 50 min)

* Question \rightarrow (50 - 55) min

5 min

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$32 \underline{4}$ ✓ $54 \underline{3}$ ✗

☛ Divisibility Rule of 2

If the **unit digit** of a number is 0, 2, 4, 6 or 8 then the number is completely divisible by 2

Eg.: 128 , 342 , 646 , 524 , 120 all are divisible by 2

☛ Divisibility

A number is completely divisible by 3 if the **sum of** all the digits of that number is divisible by 3

Eg.: 126 is divisible by 3 because $(1+2+6)$ is divisible by 3. But 2014 is not divisible by 3 because $(2+0+1+4)$ is not divisible by 3.

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$32\underline{4}$ ✓ $54\underline{3}$ ✗

☛ Divisibility Rule of 2

If the **unit digit** of a number is 0, 2, 4, 6 or 8 then the number is completely divisible by 2

Eg.: $12\underline{8}$, $34\underline{2}$, $64\underline{6}$, $52\underline{4}$, $12\underline{0}$ all are divisible by 2

☛ Divisibility rule of 3

A number is divisible by 3 only if the **sum of all the digits of that number is divisible by 3**

Eg.: 126 is divisible by 3 because $(1+2+6) = 9$ is divisible by 3. But 2014 is not divisible by 3 because $(2+0+1+4) = 7$ is not divisible by 3.

$$126 \rightarrow 1 + 2 + 6 = 9$$

$$2014 \rightarrow (7) \text{ ✗}$$

Reason - Divisibility

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Reason :- Divisibility Rule of 3

Th H T U

a b

→ $1000a + 100b + 10c +$

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Reason - Divisibility Rule of 3

Th H T U

a b c d

$$\rightarrow 1000a + 100b + 10c + d$$

$$= 999a + 99b + b +$$

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Reason - Divisibility Rule of 3

Th H T U
a b c d

→

$$\begin{array}{r} 100b + 10c + d \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ + \underline{\cancel{99}b} + b + \underline{\cancel{9}c} + c + d \end{array}$$

$\div 3 \times$

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is $\text{div } b$

Reason - Divisibility Rule of 3

Th	H	T	U
a	b	c	d

$$\rightarrow 1000a + 100b + 10c + d$$

$$\begin{array}{c} \diagup \quad \diagdown \quad \diagup \quad \diagdown \quad \diagup \quad \diagdown \\ \underline{\underline{999a}} + a + \underline{\underline{99b}} + b + \underline{\underline{9c}} + c + d \end{array}$$

$$23 + x$$

\rightarrow eg
 $x \rightarrow 1, 4, 7$

5873x is div by 3
 Find the largest value of x?)

\rightarrow (7)

☛ Divisibility Rule of 4

A number is completely divisible by 4 if the number formed by the last 2 digits of that number is completely divisible by 4.

Eg.: 2028 is divisible by 4 because the number formed by last 2 digits is 28 which is completely divisible by 4. But 5030 is not divisible by 4 because the number formed by last 2 digits is 30 which is not divisible by 4.

☛ Divisibility Rule of 5

A number is completely divisible by 5 if its unit digit is either 0 or 5. 20820 & 50345 are divisible by 5, while 3091 is not divisible by 5.

☛ Divisibility Rule of 4

A number is completely divisible by 4 if the number formed by the last 2 digits of that number is completely divisible by 4.

Eg.: 2028 is divisible by 4 because the number formed by last 2 digits is 28 which is completely divisible by 4. But 5034 is not divisible by 4 because the number formed by last 2 digits is 34 which is not divisible by 4.

☛ Divisibility Rule of 5

A number is completely divisible by 5, if its unit digit is either 0 or 5. 20820 & 50345 are divisible by 5, but 40946 is not divisible by 5.

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Reason

Div Rule of 4

 $a \quad b \quad c \quad d$

$$\cancel{1000}a + \cancel{100}b + \cancel{10}c + d$$

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Reason

Div Rule of 4

a b c d

$$\cancel{1000}a + \cancel{100}b + \cancel{10}c + d = 10c + d$$

eg

7301 ✓

$$\frac{0}{4} = 0$$

$$\frac{0}{4} = 0$$

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Reason

Div Rule of 4

$a \quad b \quad \underline{\underline{c \quad d}}$

$$\cancel{100}b + (10c + d)$$

eg

$$\begin{array}{r} 12 \\ -2 \\ \hline 10 \end{array} \quad \checkmark$$

$$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array} \quad \checkmark$$

$$\begin{array}{r} 12 \\ -10 \\ \hline 2 \end{array} \quad \times$$

$$\begin{array}{r} 0 \\ 4 \\ \hline 0 \end{array} = 0$$

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Reason

Div Rule of 4

a b c d

~~1000~~a +

10c + d

eg

72

$$\frac{0}{4} = 0$$

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Reason

Div Rule of 4

a b c d

$$\cancel{1000}a + \cancel{100}b + \cancel{10}c + d$$

eg

720

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☛ Divisibility Rule of 6

A number is divisible by 6, if it is divisible by 2 & 3 both.

Eg.: 342 is divisible by 2 as well as by 3, so this is also divisible by 6.

3142 is divisible by 2 but not by 3, so this number is not divisible by 6.

☛ Divisibility Rule of 8

A number is divisible by 8, if the number formed by the last three digits of the given number is divisible by 8.

Eg.: 95360 is divisible by 8, because the number formed by last three digits is 360 which is divisible by 8. But, 529418 is not divisible by 8, because the number formed by last three digits is 418, which is not divisible by 8.

342

2 ✓

3 ✓

6 ✓

☛ Divisibility Rule of 6

A number is divisible by 6, if it is divisible by 2 & 3 both.

Eg.: 342 is divisible by 2 as well as by 3, so this is also divisible by 6.

3142 is divisible by 2 but not by 3, so this is not divisible by 6.

3142

2

☛ Divisibility Rule of 8

A number is divisible by 8, if the number formed by the last three digits of the given number is divisible by 8.

Eg.: 95360 is divisible by 8, because the number formed by last three digits is 360 which is divisible by 8. But, 52941 is not divisible by 8, because the number formed by last three digits is 418, which is not divisible by 8.

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342

2 ✓

3 ✓

6 ✓

☛ Divisibility Rule of 6

A number is divisible by 6, if it is divisible by 2 & 3 both.

Eg.: 342 is divisible by 2 as well as by 3, so this is also divisible by 6.

3142 is divisible by 2 but not by 3, so 3142 is not divisible by 6.

3142

2

☛ Divisibility Rule of 8

A number is divisible by 8, if the number formed by the last three digits of the given number is divisible by 8.

Eg.: 95360 is divisible by 8, because the number formed by last three digits is 360 which is divisible by 8. But, 528 is not divisible by 8, because the number formed by last three digits is 418, which is not divisible by 8.

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☛ Divisibility Rule of 9

A number is divisible by 9, if the sum of its digits is divisible by 9.

Eg.: 60732 is divisible by 9, because sum of digits = $(6+0+7+3+2) = 18$, which is divisible by 9. But 68956 is not divisible by 9, because sum of digits = $(6+8+9+5+6) = 34$ which is not divisible by 9.

☛ Divisibility Rule of 10

A number is divisible by 10 if it ends on 0

Eg.: 96410, 10480 are divisible by 10, while 96375 is not divisible by 10

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Reason

Div Rule of 4

a b c d

$$\cancel{1000}a + \cancel{100}b + (10c + d)$$

eg

$$\begin{array}{r} 73 \underline{12} \checkmark \\ 69 \underline{48} \checkmark \\ 59 \underline{66} \times \\ 19 \underline{00} \checkmark \end{array}$$

Divisibility Rule of 11

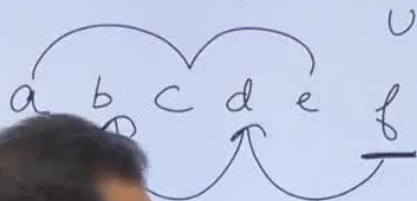
Divisibility Rule of 11



$$(f + d + b) - (e + c + a) = \dots$$

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Divisibility Rule of 11



$$(f - (e + (d - (c + (b - a)))) = \dots$$

??
↓

✓ div by 11

eg



$$(1 - (4 + (6 - 1))) = 0$$

☛ Divisibility Rule of 11

A number is divisible by 11, if the difference of the sum of digits at odd places (starting from unit digits) and the sum of digits at even place is either 0 or a multiple of 11

Eg.: 14641 is divisible by 11 because (sum of the digits at odd place) - (sum of digits at even place)

$$(1+6+1) - (4+4) = 8 - 8 = 0$$

∴ 14641 is divisible by 11

2739 is also divisible by 11. Because $(7+9) - (2+3) = 16 - 5 = 11$ (So this number is divisible by 11)

eg

59193

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eg

5 9 1 9 3 7 2 8

eg

5 8 3 9

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eg

5 9 1 9 3 7 2 8

$$33 - 11 = 22$$

eg

4 5 8 9

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5 6

eg

5 9 1 9 3 7 2 8 ✓

$$33 - 11 = 22$$

eg

3 4 5 8 3 9 ✗

$$21 - 11 = 10$$

eg

1 2 3 4 5 6 ✗

$$12 - 9 = 3$$



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Click to add notes

Reason

a b c d e f

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(3 and 4) both

☛ Divisibility Rule of 12

A number is divisible by 12, if it is divisible by both 3 & 4

Eg.: 40320 is divisible by 12 because

(i) The number formed by last by 2 digits is 20, which is divisible by 4, so this number is divisible by 4

(ii) The sum of its digits = $(4+0+3+2+0) = 9$, which is divisible by 3, so this number is divisible by 3

So if the number is divisible by 3 & 4 both, then we can say that this number is divisible by 12

40320 ✓

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12 ✓

(3 and 4) both

☛ Divisibility Rule of 12

A number is divisible by 12, if it is divisible by both 3 & 4

Eg.: 40320 is divisible by 12 because

(i) The number formed by last by 2 digits is 20, which is divisible by 4, so this number is divisible by 4

(ii) The sum of the digits = $(4+0+3+2+0) = 9$, which is divisible by 3, so this number is divisible by 3.

So if the number is divisible by 3 & 4 both, then we can say that this number is divisible by 12

4 0 3 (20)

3 ✓
4 ✓

12 ✓

2 → unit digit 0/2/4/6/8

3 → Sum of digits should

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2 \rightarrow unit digit 0/2/4/6/8

3 \rightarrow Sum of digits should be div by 3

4 \rightarrow No. formed by last 2 digits

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2 \rightarrow unit digit 0/2/4/6/8

3 \rightarrow Sum of digits should be div by 3

4 \rightarrow No. formed by last 2 digits should be div by 4

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2 \rightarrow unit digit 0/2/4/6/8

3 \rightarrow Sum of digits should be div by 3

4 \rightarrow No. formed by last 2 digits should be div by 4

5 \rightarrow Unit digit 0/5

6 \rightarrow 2 and 3 both

8 \rightarrow No. formed by last 3 digits

9 \rightarrow Sum of the digits

10 \rightarrow Unit digit 0

11 \rightarrow 

2 → unit digit 0/2/4/6/8

3 → Sum of digits should be div by 3

4 → No. formed by last 2 digits should be div by 4

5 → Unit digit 0/5

6 → 2 and 3

8 → No. formed by last 3 digits

9 →

10

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→ div by 1

Divisibility Rule of 7

Rule- I

To check whether a number is divisible by 7 or not we have to multiply the last digit by 2 & then this value will be subtracted from the number formed by rest of the digits & this process is continued till you know that the resultant value is divisible by 7 or not.

Eg.: Check whether 939715 is divisible by 7.

Step 1: 939715 $93971 - 5 \times 2 = 93961$

Step 2: 93961 $9396 - 1 \times 2 = 9394$

Step 3: 9394 $939 - 4 \times 2 = 931$

Step 4: 931 $93 - 1 \times 2 = 91$

Step 5: 91 $9 - 1 \times 2 = 7$

Here

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in books but not to be used in exams.
better rule on next slide.

I will not
suggest
you to use
this Rule

Divisibility Rule of 7

Rule- 1

To check whether a number is divisible by 7 or not we have to multiply the last digit by 2 & then this value will be subtracted from the number formed by rest of the digits & this process is continued till you know that the resultant value is divisible by 7 or not.

Eg.: Check whether 939715 is divisible by 7.

Step 1	939715	$93971 - 5 \times 2 = 93961$
Step 2	93961	$9396 - 1 \times 2 = 9394$
Step 3	9394	$939 - 4 \times 2 = 931$
Step 4	931	$93 - 1 \times 2 = 91$
Step 5	91	$9 - 1 \times 2 = 7$

Hence it is divisible by 7

I will not suggest to use Rule

A common Rule given in books but not to be used in exams.
A better rule on next slide.

A common divisibility rule of 7, 11 & 13

Hint:- Rule of 1001

13

eg

$$\begin{array}{r} 158 \\ \hline \end{array} \quad \begin{array}{r} 382 \\ \hline \end{array}$$

Ist

I

$$382 - 158$$

$$224$$

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eg

$$\begin{array}{ccc} 1 & 5 & 8 \\ \hline & & \end{array} \quad \begin{array}{ccc} 3 & 8 & 2 \\ \hline & & \end{array} \quad \checkmark$$

$\underbrace{\hspace{1.5cm}}_{\text{II}^{\text{nd}}}$
 $\underbrace{\hspace{1.5cm}}_{\text{I}^{\text{st}}}$

$$\begin{aligned} \text{I} - \text{II} &= 382 - 158 \\ &= 224 \rightarrow \text{div by 7} \end{aligned}$$

Let's take an example
125370

✓

1	2	5	3	7	0
└───┘			└───┘		
II nd			I st		

Always start from unit digit and make group of 3 digits

Now Ist group – IInd group

$$370 - 125 = 245$$

Now divide $\frac{245}{7}$ Rem = 0

So 125370 is divisible by 7

Another Example

✓ 1435392

$$\begin{array}{ccc} \boxed{1} & 4 & 3 & 5 & 3 & 9 & 2 \\ \text{III}^{\text{rd}} & \text{II}^{\text{nd}} & \text{I}^{\text{st}} \end{array}$$

$$(\text{I}^{\text{st}} + \text{III}^{\text{rd}}) - \text{II}^{\text{nd}}$$

$$(392 + 1) - 435$$

$$393 - 435 = -42$$



divisible by 7

So, 1435392 is divisible by 7

$$\begin{array}{cccc} 5 & 8 & 5 & 2 \\ \underbrace{\hspace{1cm}} & \underbrace{\hspace{1cm}} & & \\ \text{II} & \text{I} & & \end{array}$$

$$- 5 = 847$$

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eg

$$\begin{array}{cccc} 5 & 8 & 5 & 2 \\ \underbrace{}_{\text{II}} & \underbrace{}_{\text{I}} & & \end{array} \quad \checkmark$$

$$857 = \frac{847}{7} \text{ div by } 7$$

eg

$$\begin{array}{cc} 6 & 6 \\ \underbrace{}_{\text{I}} & \end{array}$$

✓

eg

$$\begin{array}{r} 5852 \\ \text{II} \quad \text{I} \end{array} \quad \checkmark$$

$$852 - 5 = \frac{847}{7} d$$

eg

$$\begin{array}{r} 58366 \\ \text{II} \quad \text{I} \end{array}$$

24

$$\begin{aligned} 366 - 58 \\ = 30 \end{aligned}$$

eg

$$\begin{array}{r} 5852 \checkmark \\ \underline{5} \\ \text{II} \text{I} \end{array}$$

$$852 - 5 = \text{div by 7}$$

eg

$$\begin{array}{r} 58366 \\ \underline{58} \\ \text{II} \text{I} \end{array}$$

24

36

eg Check whether the given no is div by 13

$$\begin{array}{r} 59 \overline{) 592} \\ \underline{59} \\ 0 \end{array}$$

$$= 592 - 59$$

$$= 533$$

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Example :
1234567887

$$N = \begin{array}{cccc} 1 & 2 & 3 & 4 \\ \square & \text{---} & \text{---} & \text{---} \\ \text{IV}^{\text{th}} & \text{III}^{\text{rd}} & \text{II}^{\text{nd}} & \text{I}^{\text{st}} \end{array} \begin{array}{ccc} 5 & 6 & 7 \\ \text{---} & \text{---} & \text{---} \\ & \text{II}^{\text{nd}} & \text{I}^{\text{st}} \end{array} \begin{array}{ccc} 8 & 8 & 7 \\ \text{---} & \text{---} & \text{---} \\ & \text{I}^{\text{st}} & \end{array}$$

$$(I^{\text{st}} + III^{\text{rd}}) - (II^{\text{nd}} + IV^{\text{th}})$$

$$(887 + 234) - (567 + 1)$$

$$1121 - 568 = 553$$

$$\begin{array}{r} 553 \\ \hline 7 \end{array} R = 0$$

1234567887 is divisible by 7.

V. Imp

Points to remember because they are asked in Exams
abcabc

a b c a b c
└──┘ └──┘
II I

I - II

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V. imp

Points to remember because they are asked in Exams

abcabc

↓

abcabc
 I I
 II I

div by 7, 11 & 13

$$I - II = 0$$

aaaaaa

aaaaaa
 T

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☛ Coprime Number

Group of numbers whose HCF = 1 are called as coprime numbers or relatively prime numbers

Eg. (2, 3), (5, 9) & (16, 27) all are coprime numbers

Divisibility rule for numbers like 24, 36, 48, 72, 30 etc.

Suppose we want to check the divisibility rule of 24.

- (i) Divide the number by 3 & 8 (both greater than 1)
- (ii) Choose the factors which are coprime

Steps

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If a number is divisible by 3 & 8 both, then it is divisible by 24

☛ Coprime Number

Group of numbers whose HCF = 1 are called as coprime numbers or relatively prime numbers

Eg. (2, 3), (5, 9) & (16, 27) all are coprime numbers

Divisibility rule of some numbers like 24, 36, 48, 72, 30 etc.

Suppose we have to find the divisibility rule of 24.

- (i) Divide 24 into 2 factors (both greater than 1)
- (ii) Choose those pair of factors which are coprime

Steps

24

→

Coprime

Divisibility Rule of 24 → If a number is divisible by 3 & 8 both, then it is divisible by 24

Divisibility Rule

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Divisibility Rule of 24



Divisibility Rule of 24



Divisibility Rule of 24

Step 1

$$\times \underline{N_2} = 24$$

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Divisibility Rule of 24

Step 1

N_1

\times

N_2

4

$$\left[\begin{array}{l} N_1 > 1 \\ N_2 \end{array} \right]$$

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Divisibility Rule of 24

Step 1

$$\underline{N_1} \times \underline{N_2} = 24 \quad \left[\begin{array}{l} N_1 > 1 \\ N_2 > 1 \end{array} \right]$$

$$\underline{2} \cdot \underline{12}$$

$$3 \cdot 8 \quad \underline{\underline{\quad}}$$

$$\underline{4} \cdot \underline{6}$$

Step 2 \rightarrow Coprime

Find Rules of 36, 48, 72, 20, 30

36

$$\cancel{2 \cdot 18}$$

$$\cancel{3 \cdot 12}$$

$$4 \cdot 9$$

$$\cancel{6 \cdot 6}$$

48

$$\cancel{2 \cdot 24}$$

$$3 \cdot 16$$

$$\cancel{4 \cdot 12}$$

$$\cancel{6 \cdot 8}$$

72

$$\cancel{2 \cdot 36}$$

$$\cancel{3 \cdot 24}$$

$$\cancel{4 \cdot 18}$$

$$\cancel{6 \cdot 12}$$

$$8 \cdot 9$$

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Find Rules of 36, 48, 72, 20, 30

36

~~2 · 18~~

~~3 · 12~~

✓ 4 · 9

~~6 · 6~~

48

~~2 · 24~~

3 · 16

~~4 · 12~~

~~6 · 8~~

72

20

2 · 10

4 · 5

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Rule of 36 → 4 & 9

Rule of 48 → 3 & 16

Rule of 80 → 5 & 16

Rule of 72 → 8 & 9

Rule of 30 → 2 & 15

and 3 & 10

and 5 & 6

If a number is divisible by 2, 3 & 5 then it is divisible by 30

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Rule of 36 → 4 & 9

Rule of 48 → 3 & 16

Rule of 80 → 5 & 16

Rule of 72 → 8

Rule of 30 →

30

10

6

If a number is divisible by 10 and 3, it is divisible by 30

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Rule of 36 → 4 & 9

Rule of 48 → 3 & 16

Rule of 80 → 5 & 16

Rule of 72 → 8 & 9

Rule of 30 →

30

2 · 15

3 · 10

5 ·

If a number is divisible by 3 & 5 then it is divisible by 30

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$$\begin{array}{l|l} 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ & 1 \end{array}$$

$$36 = \underbrace{2 \cdot 2}_4 \cdot \underbrace{3 \cdot 3}_9$$

$$36 \rightarrow \underline{\underline{4 \ \& \ 9}}$$

$$\begin{array}{l|l} 2 & 48 \\ 2 & 24 \\ 2 & 12 \\ 2 & 6 \\ 3 & 3 \\ & 1 \end{array}$$

$$48 = \underbrace{2 \cdot 2 \cdot 2 \cdot 2}_{16} \cdot \underbrace{3}_3$$

$$48 \rightarrow \underline{\underline{16 \ \& \ 3}}$$

$$\begin{array}{l} \left. \begin{array}{l} 2 \mid 72 \\ 2 \mid 36 \\ 2 \mid 18 \\ 3 \mid 6 \\ 3 \mid 2 \end{array} \right\} \end{array}$$

$$\begin{array}{l} 2 \mid 30 \\ 3 \mid 15 \\ 5 \mid 5 \\ 1 \end{array}$$

$$30 = 2 \cdot 3 \cdot 5$$

$$\rightarrow 2, 3 \text{ \& } 5$$

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$$\begin{array}{l} \left. \begin{array}{r} 2 \\ 2 \\ 2 \end{array} \right\} \begin{array}{r} 72 \\ 36 \\ 18 \end{array} \\ \left. \begin{array}{r} 3 \\ 3 \end{array} \right\} \begin{array}{r} 9 \\ 3 \end{array} \\ 1 \end{array}$$

$$72 = \underbrace{2 \cdot 2 \cdot 2}_8 \cdot \underbrace{3 \cdot 3}_9$$

$$72 \rightarrow 8 \text{ \& } 9$$

$$\begin{array}{l} \left. \begin{array}{r} 2 \\ 3 \\ 5 \end{array} \right\} \begin{array}{r} 30 \\ 15 \\ 5 \end{array} \\ 1 \end{array}$$

$$30 = \underline{2 \cdot 3 \cdot 5}$$

$$30 \rightarrow \underline{2, 3 \text{ \& } 5}$$

Divisibility Rules for Numbers of the form 2^n or 5^n

If a number is of the form 2^n or 5^n then to check whether the number are divisible by 2^n or 5^n then the last n digits of that number should be checked

Eg.:

$$2 = 2^1 \rightarrow \text{last 1 digit}$$

$$4 = 2^2 \rightarrow \text{No formed by last 2 digits}$$

$$8 = 2^3 \rightarrow \text{No formed by last 3 digits.}$$

$$16 = 2^4 \rightarrow \text{No formed by last 4 digits.}$$

$$32 = 2^5 \rightarrow \text{No formed by last 5 digits.}$$

formed by last 2 digits

formed by last 3 digits

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$$2^n$$

$$5^n$$

Div Rule of 2 = $2^{\textcircled{1}}$ \textcircled{U}

$$4 = 2^{\textcircled{2}} \quad \boxed{\text{last 2 digits}}$$

$$8 = 2^{\textcircled{3}} \quad \boxed{\text{last 3 digits}}$$

$$16 = 2^{\textcircled{4}} \quad \text{last 4 digits}$$

$$32 = 2^{\textcircled{5}} \quad \underline{\text{last 5 digits}}$$

$$2^n$$

$$5^n$$

Div Rule of 2 = $2^{(1)}$ Unit

$$4 = 2^{(2)} \quad [4 \quad 1]$$

$$8 = 2^{(3)} \quad [6 \quad 1 \quad 1]$$

$$16 = 2^4$$

$$32$$

$$5^{(1)}$$

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2^n

5^n

Div Rule of 2 = $2^{\textcircled{1}}$

Unit $5^{\textcircled{1}}$

$2^{\textcircled{2}}$

Last 2 digits

$2^{\textcircled{3}}$

Last 3 digits

Last 4 digits

Last 5 digits

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Divisibility Rules for Numbers of the form 2^n or 5^n

If a number is of the form 2^n or 5^n then to check whether the number are divisible by 2^n or 5^n then the last n digits of that number is to be checked

Eg.:

$$2 = 2^1 \rightarrow \text{last 1 digit}$$

$$4 = 2^2 \rightarrow \text{No formed by last 2 digits}$$

$$8 = 2^3 \rightarrow \text{No formed by last 3 digits.}$$

$$16 = 2^4 \rightarrow \text{No formed by last 4 digits.}$$

$$32 = 2^5 \rightarrow \text{No formed by last 5 digits.}$$

$$5 = 5^1 \rightarrow \text{Last 1 digit}$$

$$25 = 5^2 \rightarrow \text{No formed by last 2 digits}$$

$$125 = 5^3 \rightarrow \text{No formed by last 3 digits}$$

Divisibility Rules for Numbers of the form 2^n or 5^n

If a number is of the form 2^n or 5^n then to check whether the number are divisible by 2^n or 5^n then the last n digits of that number is to be checked

Eg.:

$$2 = 2^1 \rightarrow \text{last 1 digit}$$

$$4 = 2^2 \rightarrow \text{No formed by last 2 digits}$$

$$8 = 2^3 \rightarrow \text{No formed by last 3 digits.}$$

$$16 = 2^4 \rightarrow \text{No formed by last 4 digits.}$$

$$32 = 2^5 \rightarrow \text{No formed by last 5 digits.}$$

$$5 = 5^1 \rightarrow \text{Last 1 digit}$$

$$25 = 5^2 \rightarrow \text{No formed by last 2 digits}$$

$$125 = 5^3 \rightarrow \text{No formed by last 3 digits}$$

4. If $92675x2$ is completely divisible by 8 then which digit should come in place of x ?

(A) 8

(B) 7

(C) 6

(D) 5

14. Find the remainder when 555555.....(100 digits) is divided by 16.

(A) 5

(B) 7

(D) 3

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14. Find the remainder when 555555.....(100 digits) is divided by 16.

(A) 5

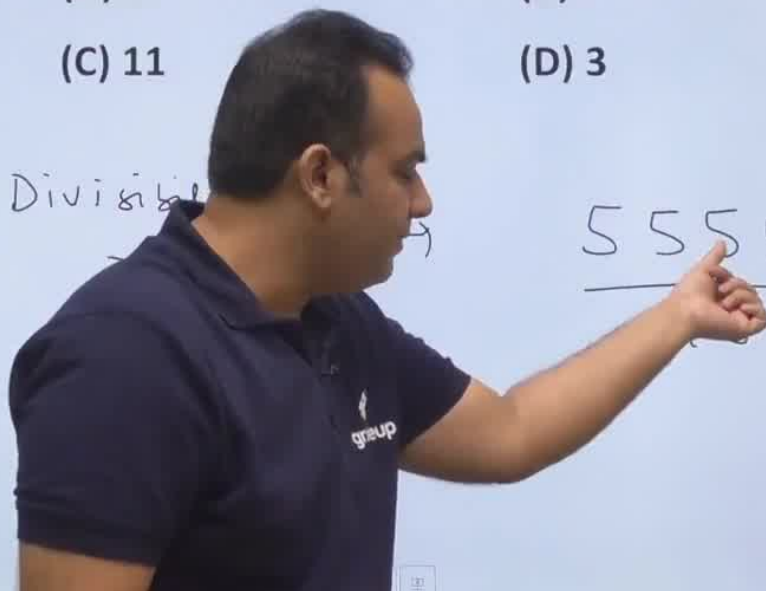
(B) 7

(C) 11

(D) 3

Divisible

5555



14. Find the remainder when 555555.....(100 digits) is divided by 16.

(A) 5

(B) 7

(C) 11

(D) 3

Divisible

$$\begin{array}{r} 5555 \\ \hline 16 \end{array}$$

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PYQ of
SSC

15. Which of the following number is divisible
by 25?

sol.

5555

(A) 389765

(B) 268985

(C) 413275

(D) 681935

Rem = 3

PYQ of
SSC

15. Which of the following number is divisible
by 25?

(A) 389765 ✗

(B) 268985 ✗

(C) 13275

(D) 681935

Div $25 = 5^{\textcircled{2}}$





PYQ of
SSC

15. Which of the following number is divisible by 25?

(A) 389765 ✗ (B) 268985 ✗

(C) 413275 (D) 681935

Div Rule of 25 = 5^2

Click to add notes



Notes





PRACTICE QUESTIONS

Click to add notes

PRACTICE QUESTIONS

1. Find the smallest value of x such that $78326x42$ is divisible by 9.

(A) 3

(B) 4

(C) 5

(D) 6

**Sahi Prep Hai
Toh Life Set Hai**

1. Find the smallest value of x such that $78326x42$ is divisible by 9.

(A) 2

(B) 4

(C) 3

(D) 6

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Toh Life Set Hai**

1. (B)

Sol. 78326×42

$$7 + 8 + 3 + 2 + 6 + x + 4 + 2$$

$$32 + x = 9 \text{ m}$$

$$32 + x \rightarrow 36, 45, \dots\dots\dots$$

$$x = 4, 13, \dots\dots\dots$$

Since x is a single digit number so it has to be 4.

2. For how many values of x , $78326x42$ is divisible by 3 ?

(A) 2

(B) 3

(C) 4

(D) 5

3 → div by

**Sahi Prep Hai
Toh Life Set Hai**

2. For how many values of x , $78326x42$ is divisible by 3?

(A) 2

~~(B) 3~~

(C) 4

(D) 5

$$32 + x \rightarrow \text{div by } 3$$

$$x = 0 \quad \times$$

$$x = 1 \quad \checkmark$$

$$4 \quad \checkmark$$

$$7 \quad \checkmark$$

3. Find value/values of x if $3829x6$ is divisible by 4?

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3. Find value/values of x if $3829\underline{x}6$ is divisible by 4?

Div Rule 4 \rightarrow No. for

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Toh Life Set Hai

3. Find value/values of x if $3829\underline{\underline{x6}}$ is divisible by 4?

Div Rule of 4

No. formed by

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Toh Life Set Hai**

3. Find value/values of x if $3829\underline{\underline{x}}6$ is divisible by 4?

Div Rule of 4 \rightarrow No. formed by last 2 digits

**Sahi Prep Hai
Toh Life Set Hai**

3. Find value/values of x if $3829x6$ is divisible by 4?

Div Rule of 4 \rightarrow No. formed by last 2 digits

$x 6$ — 06 X

16 ✓

26 X

36 ✓

56 ✓

76 ✓

96 ✓

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$$3829 \times 6$$

d

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$$3829 \times 6$$

div by 4

**Sahi Prep Hai
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$$\begin{array}{r} \text{T U} \\ 3829 \times 6 \\ \hline \end{array}$$

div by 4

$$\begin{array}{r} 2x \quad 2 \\ \cancel{10x} + \cancel{6} \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2x + 2 \\ \hline 4 \end{array}$$

$$\begin{array}{r} 2(x+1) \\ \hline 4 \end{array}$$

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Toh Life Set Hai

$$| 3 | 5 | 7 | 9$$

$$3829 \overset{T}{\times} \overset{U}{6}$$

div by 4

$$\frac{\overset{2x}{\cancel{10}x} + \overset{2}{\cancel{6}}}{4}$$

$$\rightarrow \frac{2x+2}{4}$$

$$\frac{2(x+1)}{4}$$

$$x \rightarrow \underline{1|3|5|7|9}$$

$$\frac{5 \times 2}{8}$$

$$\frac{502 +}{8}$$

$$\frac{6 +}{8}$$

4. If $92675\underline{x}2$ is completely divisible by 8 then which digit should come in place of x ?

(A) 8

(B) 7

(C) 6

(D) 5

$$\frac{5 \times 2}{8}$$

$$\frac{502 + 10x}{8}$$

$$\frac{6 + 2x}{8}$$

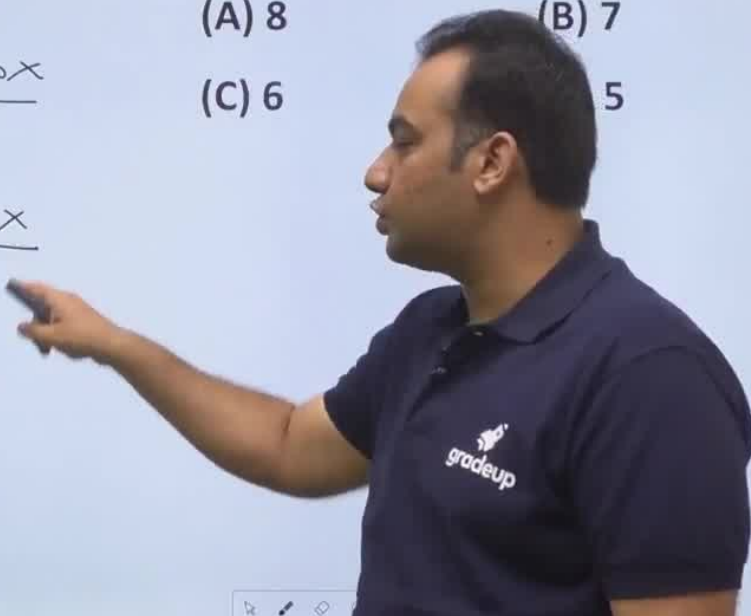
4. If $92675x2$ is completely divisible by 8 then which digit should come in place of x ?

(A) 8

(B) 7

(C) 6

5



$$\frac{5x2}{8}$$

$$\frac{502 + 10x}{8}$$

$$\frac{6 + 2x}{8}$$

4. If $92675x2$ is completely divisible by 8 then which digit should come in place of x ?

(A) 8

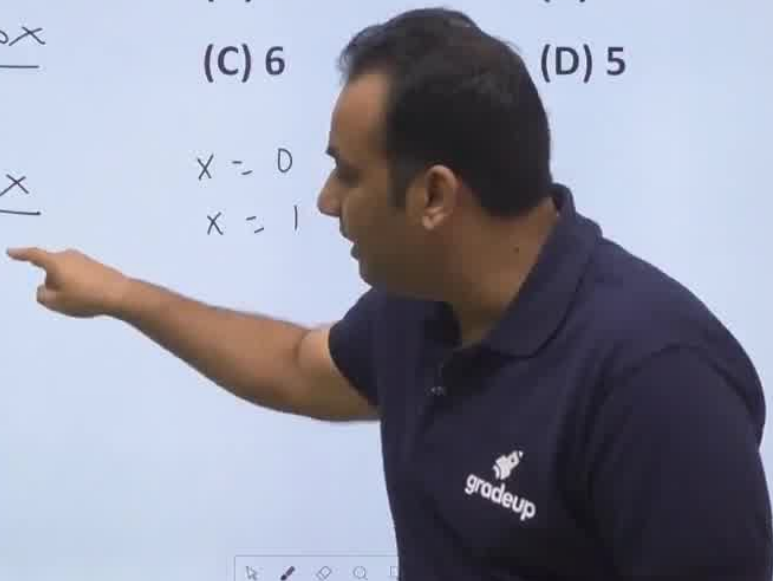
(B) 7

(C) 6

(D) 5

$$x = 0$$

$$x = 1$$



$$\frac{5 \times 2}{8}$$

$$\frac{502 + 10x}{8}$$

$$\frac{6 + 2x}{8}$$

4. If 92675x2 is completely divisible by 8 then which digit should come in place of x ?

(A) 8

(B) 7

(C) 6

(D)

$$\begin{aligned} x &= 0 \quad \times \\ x &= 1 \quad \checkmark \\ x &= \end{aligned}$$

$$\frac{5x2}{8}$$

$$\frac{502 + 10x}{8}$$

$$\frac{6 + 2x}{8}$$

4. If 92675x2 is completely divisible by 8 then which digit should come in place of x ?

(A) 8

(B) 7

(C) 6

(D)

$$\begin{aligned} x &= 0 & \times \\ x &= 1 & \checkmark \\ x &= 5 & \checkmark \\ x &= \end{aligned}$$

5. If $78x3945$ is completely divisible by 11 then which digit should come in place of x ?

(A) 0

(B) 1

(C) 3

✓ (D) 5

$$78x3945$$

$$(21 + x) - 15$$

$$6 + x$$

div by 11

$$x = 5$$

5. (D)

Sol.

$$\overbrace{78} \quad * \quad \overbrace{3945}$$

$$(5 + 9 + * + 7) - (4 + 3 + 8)$$

$$(21 + *) - (15)$$

$$6 + * = 0, 11, 22$$

$$* = -6, 5, 16$$

$$\boxed{* = 5}$$

6. On adding 984 to a three digit number $4a3$, we get a four digit number $13b7$, which is completely divisible by 11. Find the value of $(a+b)$?

(A) 10

(B) 11

(C) 12

(D) 15

6. On adding 984 to a three digit number $4a3$, we get a four digit number $13b7$, which is completely divisible by 11. Find the value of $(a+b)$?

(B) 11

(D) 15

$$(7+3) - (b+1) \text{ div by } 11$$

$$9 - b$$

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6. On adding 984 to a three digit number $4a3$, we get a four digit number $13b7$, which is completely divisible by 11. Find the value of $(a+b)$?

(A) 10

(B) 11

(C) 12

(D) 15

$$984 + (400 + a0 + 3) = 1300 + b0 + 7 \text{ div by } 11$$

$$+ 984 + 403 - b \text{ div by } 11$$

**Sahi Prep Hai
Toh Life Set Hai**

6. On adding 984 to a three digit number $4a3$, we get a four digit number $13b7$, which is completely divisible by 11. Find the value of $(a+b)$?

(A) 10

(B) 11

(C) 12

(D) 15

$$984 + (400 + 10a + 3) = 1300 + 10b + 7$$

$$984 + 403 + 10a = 1307 + 10b$$

$$9 - b \text{ div by } 11$$

$$b = 9$$

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Toh Life Set Hai**

V. Anp

7. Both the end digits of a 99 digit number N are 2. N is divisible by 11, then all the middle digits are :

(A) 1

(B) 2

(C) 3

(D) 4

6. On adding 984 to a three digit number $4a3$, we get a four digit number $13b7$, which is completely divisible by 11. Find the value of $(a+b)$?

$$a = 1$$

$$b = 9$$

(A)

(C)

(B) 11

(D) 15

$$(7+3) - (b+1) \text{ div by } 11$$

$$9 - b \text{ div by } 11$$

$$\boxed{= 9}$$

Ans. (d)

$$2 \times n \times n \times n \times n \times n \times n$$

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Toh Life Set Hai**

Ans. (d)

$$\begin{array}{ccccccccccc} 2 & x & n & n & n & n & x & x & \underline{2} \\ \downarrow & & & & & & & & \uparrow \\ & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \text{---} & \end{array}$$

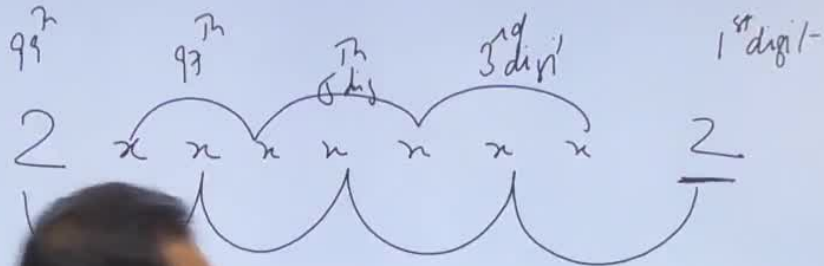
Sahi Prep Hai
Jah Life Set Hai

Ans. (d)

$$\begin{array}{ccccccc}
 & & & & 3^{\text{rd}} & & 1^{\text{st}} \text{ digit} \\
 & & & & d & & /- \\
 2 & x & x & x & x & x & x \\
 \underbrace{\hspace{1.5cm}} & & \underbrace{\hspace{1.5cm}} & & \underbrace{\hspace{1.5cm}} & & \underbrace{\hspace{1.5cm}} \\
 & & & & & & \underline{\underline{2}}
 \end{array}$$

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Ans. (d)



$$(2 + 5n) - 49x$$

Salhi Prep Hall
Tah Lile Set Hall

Ans. (d)

Sahi Prep Hai
Toh Life Set Hai

SA
1

Ans. (d)

99^{th} 7^{th} 5^{th} 3^{rd} 1^{st}

1-99

99 pos

50 odd

49 ev

2

Sahi Prep Hai
Toh Life Set Hai

Ans. (d)

99^{th} 7^{th} 5^{th} 3^{rd} 1^{st}

1-99

99 position

50 odd position

49 even position

$x \ x \ x \ x \ x \ x \ x \ \underline{\underline{2}}$

**Sahi Prep Hai
Toh Life Set Hai**

Ans. (d)

99^{th} 7^{th} 5^{th} 3^{rd} 1^{st}

1-99

99 position



So odd position

49 even

$$(2 + 2 + 48n)$$

Sahi Prep Mai
Tota Life Set Mai

Ans. (d)

99^{th} 7^{th} 5^{th} 3^{rd} 1^{st}

1-99

99 position

50 odd position

49 even position



(2)

49x div by

**Sahi Prep Hai
Toh Life Set Hai**

Ans. (d)

99^{th} 7^{th} 5^{th} 3^{rd} 1^{st}

1-99

99 position

50 odd position

49 even position



$$(2 + 2 + 48n) - 49x \text{ div by } 11$$

$$4 - x \text{ div by } 11$$

$$x = 4$$

V. Imp

7. Both the end digits of a 99 digit number N are 2. N is divisible by 11, then all the middle digits are :

(A) 1

(B) 2

(C) 3

(D) 4

2 2

abcabc

8. A 6 digit number is formed by repeating a 3 digit number twice such as 123123, 374374 etc. Any number of this form is always exactly divisible by ?

(A) 7

(C) 1

(B) 11

(D) All of these

$\underbrace{aaaaaa}_{II} \quad \underbrace{aaaaaa}_{II}$

$II - \text{II}$

9. A 6 digit number is formed by repeating a single digit six times such as 222222, 333333 etc. Any number of this form is always exactly divisible by ?

(A) 7

(B) 11

(C) 13

(D) All of these

10. Find the remainder when 44444444.....(100 digits) is divided by 7.

aaaaaa

↓

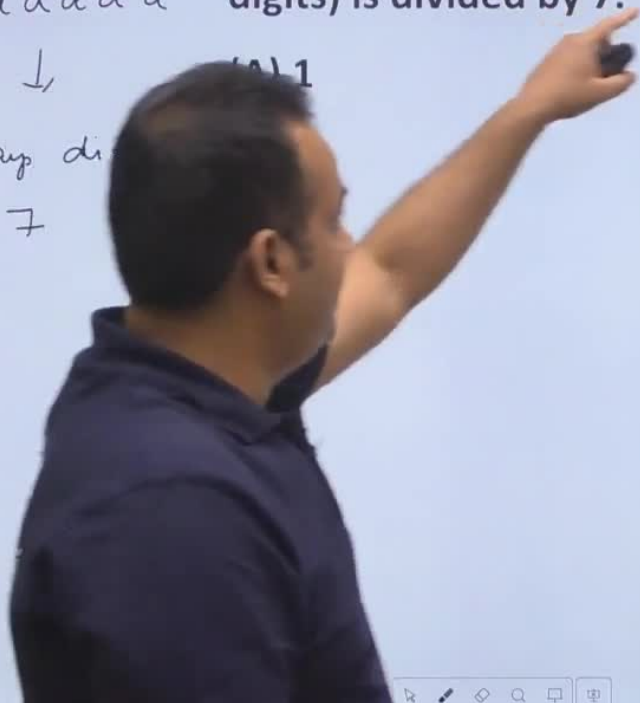
always di

7

(A) 1

(B) 2

(D) 6



10. Find the remainder when 44444444.....(100 digits) is divided by 7.

aaaaaa

↓

always div by

7

(A) 1

(B) 2

(C) 4

(D) 6

4444 --- (96 times)

**Sahi Prep Hai
Toh Life Set Hai**

10. Find the remainder when 44444444.....(100 digits) is divided by 7.

aaaaaa

↓

always div by

7

(A) 1

(B) 2

(D) 6

444444 - - - - - (96 times)

7

**Sahi Prep Hai
Toh Life Set Hai**

10. Find the remainder when 44444444.....(100 digits) is divided by 7.

aaaaaa

↓

always div by

7

(A) 1

(B) 2

(C) 4

(D) 6

$$\begin{array}{r} 44444444 \dots \dots \dots (96 \text{ times}) \\ \hline 7 \end{array}$$

Rem = 0

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Toh Life Set Hai**

Rem = 6

10. Find the remainder when 44444444.....(100 digits) is divided by 7.

aaaaaa

↓

always div by

7

(A) 1

(B) 2

(C) 4

☒ (D) 6

$$\begin{array}{r} 444444 \text{ --- (96 times)} \\ \hline 7 \end{array}$$

Rem = 0

$$\begin{array}{r} 4444 \\ \hline 7 \end{array}$$

Rem = 6

11. A 2 digit number is written two times together to form a 4 digit number such as 2525, 3232 etc. The number of this form is always divisible by ?

A. 7

B. 11

C. 13

D. The smallest 3 digit Prime number.



11. A 2 digit number is written two times together to form a 4 digit number such as 2525, 3232 etc. The number of this form is always divisible by ?

A. 7

11

C. 13

The smallest 3 digit Prime number.

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Toh Life Set Hai**

$1009 + 1001$

11. A 2 digit number is written two times together to form a 4 digit number such as 2525, 3232 etc. The number of this form is always divisible by ?

A. 7

B. 11

C. 13

The smallest 3 digit Prime number.

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$$1000a + 100b + 10a + b$$

$$1010a + 101b$$

18. Find the largest 5 digit number which is completely divisible by 91 ?

(A) 99918

(B) 99921

(C) 99931

(D) 99971

**Sahi Prep Hai
Toh Life Set Hai**

18. Find the largest 5 digit number which is completely divisible by 91 ?

(A) 99918

(B) 99921

(C) 99981

(D) 99971

Handwritten work on a whiteboard:

109

91 | 99999

99999
 81
 ———
 99

**Sahi Prep Hai
 Toh Life Set Hai**

$$\begin{array}{r} 5 \\ 9 \overline{) 47} \\ \underline{45} \\ 2 \end{array}$$

18. Find the largest 5 digit number which is completely divisible by 91 ?

(A) 99918

(B) 99921

(C) 99981

(D) 99971

$$\begin{array}{r} 1098 \\ 91 \overline{) 99999} \\ \underline{91} \\ 899 \\ \underline{819} \\ 809 \\ \underline{728} \\ 81 \end{array}$$

$$\begin{array}{r} 99999 \\ 81 \\ \hline 99918 \end{array}$$

$$\begin{array}{r}
 900 \\
 \hline
 111 \overline{) 100000} \\
 \underline{999} \\
 100
 \end{array}$$

$$\begin{aligned}
 &100000 + 11 \\
 &= \underline{100011}
 \end{aligned}$$

19. Find the smallest 6 digit number which is completely divisible by 111?

(A) 111111

(B) 110011

☒ (C) 100011

(D) 999712

20. How many five-digit numbers of the form $XXYXX$ is/are divisible by 33?

(a) 1

(b) 3

(c) 5

(d) Infinite

22. The seven-digit number $876p37q$ is divisible by 225. The value of p and q can be respectively:

(a) 9, 0

(b) 0, 0

(c) 1, 5

(d) 9, 5



Divisibility Rule of
225

$$\begin{array}{r} 3 \overline{) 225} \\ 3 \quad 75 \\ 5 \quad 25 \\ 5 \quad 5 \end{array}$$

22. The seven-digit number $876p37q$ is divisible by 225. The value of p and q can be respectively:

(a) 9, 0

(b) 0, 0

(c) 1, 5

(d) 9, 5

Div Rule of 25

**Sahi Prep Hai
Toh Life Set Hai**

Divisibility Rule of
225

$$\left\{ \begin{array}{l} 3 \\ 3 \\ 5 \\ 5 \end{array} \right\} \begin{array}{r} 225 \\ 75 \\ 25 \\ 5 \\ 1 \end{array}$$

$$9 \times 25 = 225$$

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22. The seven-digit number $876p37q$ is divisible by 225. The value of p and q can be respectively:

(a) 9, 0

(b) 0, 0

(c) 1, 5

(d) 9, 5

Divisible by 25

$$q = 5$$

375

→ div by 9

Divisibility Rule of
225

$\left\{ \begin{array}{l} 3 \\ 3 \end{array} \right\}$

$\left\{ \begin{array}{l} 5 \\ 5 \end{array} \right\}$

22. The seven-digit number $876p37q$ is divisible by 225. The value of p and q can be respectively:

(a) 9, 0

(b) 0, 0

(c) 1, 5

(d) 9, 5

Div by 25

$7q$

$$q = 5$$

$876p375$

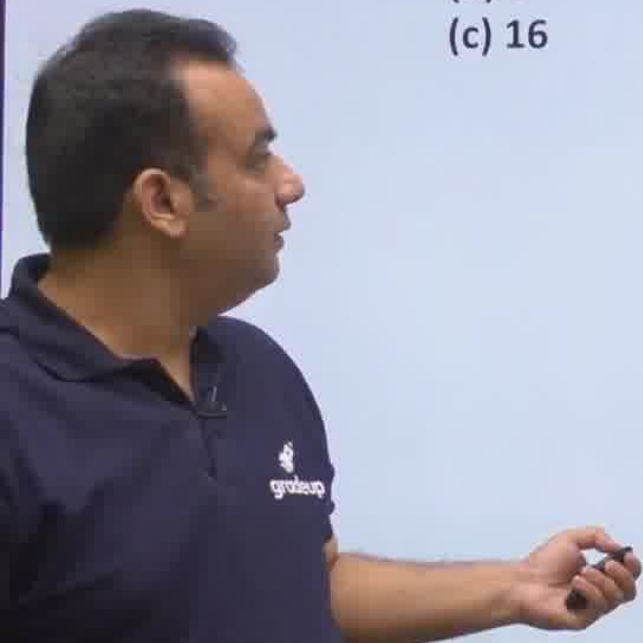
$36 + p \rightarrow \text{div by } 9$

$p \rightarrow 0/9$

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23. If the nine-digit number $708x6y8z9$ is divisible by 99, then what is the value of $x + y + z$?

- (a) 5 (b) 27
(c) 16 (d) 9



9.mpf

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

(a) 12

(b) 10

(c) 13

(d) 14

$$\begin{array}{cccccc} x & 3 & 5 & 6 & 2 & 4 \\ & \underbrace{\hspace{1.5cm}} & & \underbrace{\hspace{1.5cm}} & & \end{array}$$

$$13 - (7 + x)$$

$$6 - x$$

$$\boxed{x = 6}$$

$$125744$$

**Sahi Prep Hai
Toh Life Set Hai**

9 mp

$$x35624$$

$$13 - (7 + x)$$

$$6 - x$$

$$x = 6$$

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

(a) 12

(b) 10

(c) 13

(d) 14

$$1257y4 \quad [829]$$

**Sahi Prep Hai
Toh Life Set Hai**

9. mup

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

(a) 12

(b) 10

(d) 14

$$x35624$$

$$13 - (7 + x)$$

$$6 - x$$

$$x = 6$$

$$1257y4$$

$$[829]$$

$$19 + y$$

**Sahi Prep Hai
Toh Life Set Hai**

9. mup

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

(a) 12

(b) 10

(c) 11

(d) 14

$$x35624$$

$$13 - (7 + x)$$

$$6 - x$$

$$\boxed{x = 6}$$

$$1257y4 \quad [829]$$

$\rightarrow \text{div by } 8$

**Sahi Prep Hai
Toh Life Set Hai**

9 mp

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

(a) 12

(b) 10

(c) 13

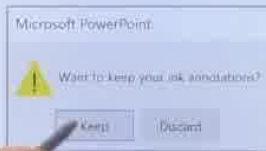
☒ (d) 14

$$x \overbrace{35624}^{11}$$

$$13 - (7 + x)$$

$$6 - x$$

$$x = 6$$



$$\overbrace{744}^{72}$$

$$[859]$$

$$18 + 4 \rightarrow \text{div by } 9$$

$$y = 8$$

$$5 \cdot 6 - 2 \cdot 8 \\ = 14$$



9mp

24. If the 6-digit numbers $x35624$ and $1257y4$ are divisible by 11 and 72, respectively, then what is the value of $(5x - 2y)$?

- (a) 12 (b) 10
(c) 13 (d) 14

$$x \ 3 \ 5 \ 6 \ 2 \ 4$$

$$13 - (7 + x)$$

$$6 - x$$

$$x = 6$$

$$1 \ 2 \ 5 \ 7 \ 4 \ 4 \quad [8 \ 2 \ 9]$$

$$19 + 4 \rightarrow \text{div by } 9$$

$$56 - 2 \cdot 8 = 14$$

$$y = 8$$

Click to add notes



Click to add title

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$$x \quad 3 \quad 5 \quad 6 \quad 2 \quad 4$$

~~~~~

$$13 - (7 + x)$$

$$6 - x$$

$$x = 6$$

$$(5x - 2y)?$$

$$(a) 12$$

$$(c) 13$$

$$(b) 10$$

$$(d) 14$$

$$125 \quad \underline{744} \quad [829]$$

$$19 + 4 \rightarrow \text{div by } 9$$

$$y = 8$$

$$56 - 2 \cdot 8 = 14$$

Click to add notes

Hai  
t Hai

9. mvp

24. If the 6-digit numbers  $x35624$  and  $1257y4$  are divisible by 11 and 72, respectively, then what is the value of  $(5x - 2y)$ ?

(b) 10

☒ (d) 14

$$x \overbrace{35624}^{13}$$

$$13 - (7 + x)$$

$$6 - x$$

$$\boxed{x = 6}$$

$$\begin{array}{r} 125744 \\ - 125744 \\ \hline 0 \end{array} \quad [8 \div 9]$$

$$18 + 4 = 22 \text{ by } 9$$



level of our class

**Sahi Prep Hai  
Toh Life Set Hai**

Level of our classes TT

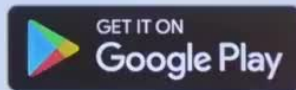




Sahi Prep Hai Toh Life Set Hai

Practise  
topic-wise quizzes

Keep attending  
live classes





Sahi Prep Hai Toh Life Set Hai

Practise  
topic-wise quizzes

Keep attending  
live classes

