

EXERCISE 5A

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Q1. The units digit of a two-digit number is 3 and seven times the sum of the digits is the number itself. Find the number.

Solution:

We know that the unit place is 3

So let's consider the tens place as y

So the equation is $(10y + 3)$ Equation (1)

From the question, seven times the sum of the digits is the number itself

••from the above condition, $7(y + 3)$ Equation (2)

Combining equation 1 and 2 we get,

$$7(y + 3) = (10y + 3)$$

$$7y + 21 = 10y + 3$$

$$7y - 10y = 3 - 21$$

$$-3y = -18$$

$$\therefore y = 6$$

Substituting the value of y in equation 1 we get,

$$10y + 3$$

$$10(6) + 3 = 60 + 3 = 63$$

•• the required number is 63

Q2. In a two-digit number, the digit at the units place is double the digit in the tens place. The number exceeds the sum of its digits by 18. Find the number.

Solution: we know that the digit at the units place is double the digit in the tens place.

So let's consider the tens place as y

The digit at the unit place is $2y$

So the equation is $(10y + 2y) = 12y$ Equation (1)

From the question, the number exceeds the sum of its digits by 18

••from the above condition, $(y + 2y) + 18$ Equation (2)

Combining equation 1 and 2 we get,

$$(y + 2y) + 18 = (10y + 2y)$$

$$3y + 18 = 12y$$

$$18 = 12y - 3y$$

$$18 = 9y$$

∴ $y = 2$

Hence, the digit tens place is 2

The digit unit place is $2y = 2(2) = 4$

Substituting the value of y in equation 1 we get,

$$12y$$

$$12(2) = 24$$

∴ the required number is 24

Q3. A two-digit number is 3 more than 4 times the sum of its digits. If 18 is added to the number, its digits are reversed. Find the number.

Solution: let us consider the unit place digit as x and tens place digit as y .

The equations becomes $10y + x$equation (1)

From the question, a two-digit number is 3 more than 4 times the sum of its digits

∴ from the above condition, $4(y + x) + 3$ equation (2)

Combining equation 1 and 2

$$4(y + x) + 3 = 10y + x$$

$$4y + 4x + 3 = 10y + x$$

$$4x - x + 4y - 10y = -3$$

$$3x - 6y = -3$$

$$3(x - 2y) = -3$$

$$X - 2y = -1 \text{equation (3)}$$

From the second condition, If 18 is added to the number, its digits are reversed

∴ the reversed number is $10x + y$equation (4)

∴ by the given condition

$$(10y + x) + 18 = 10x + y$$

$$10y - y = 10x - x - 18$$

$$9y - 9x = -18$$

$$9(y - x) = -18$$

$$Y - X = -2 \text{equation (5)}$$

Solving equation 3 and 5 simultaneously we get,

$$Y = 3 \text{ and } x = 5$$

∴ the required number is $(10y + x) = (10(3) + 5) = 30 + 5 = 35$

EXERCISE 5B

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1. Test the divisibility of each of the following numbers by 2:**i. 94**

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 4 which is divisible by 2

••the given number 94 is divisible by 2

ii. 570

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 0 which is divisible by 2

••the given number 570 is divisible by 2

iii. 285

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 5 which is not divisible by 2

••the given number 285 is not divisible by 2

iv. 2398

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 8 which is divisible by 2

••the given number 2398 is divisible by 2

v. 79532

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 2 which is divisible by 2

••the given number 79532 is divisible by 2

vi. 13576

Solution: we know that if the unit place digit is divisible by 2 then our given number is

divisible by 2.

Here, the unit place of the given number is 6 which is divisible by 2

- the given number 13576 is divisible by 2

vii. 46821

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 1 which is not divisible by 2

- the given number 46821 is not divisible by 2

viii. 84663

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 3 which is not divisible by 2

- the given number 84663 is not divisible by 2

ix. 66669

Solution: we know that if the unit place digit is divisible by 2 then our given number is divisible by 2.

Here, the unit place of the given number is 9 which is not divisible by 2

- the given number 66669 is not divisible by 2

Q2. Test the divisibility of each of the following numbers by 5:

i. 95

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 5 which is divisible by 5

- the given number 95 is divisible by 5

ii. 470

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 0 which is divisible by 5

- the given number 470 is divisible by 5

iii. 1056

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 6 which is not divisible by 5

∴ the given number 1056 is not divisible by 5

iv. 2735

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 5 which is divisible by 5

∴ the given number 2735 is divisible by 5

v. 55053

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 3 which is not divisible by 5

∴ the given number 55053 is not divisible by 5

vi. 35790

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 0 which is divisible by 5

∴ the given number 35790 is divisible by 5

vii. 98765

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 5 which is divisible by 5

∴ the given number 98765 is divisible by 5

viii. 42658

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 8 which is not divisible by 5

∴ the given number 42658 is not divisible by 5

ix. 77990

Solution: we know that if the unit place digit is divisible by 5 then our given number is divisible by 0 or 5.

Here, the unit place of the given number is 0 which is divisible by 5

∴ the given number 77990 is divisible by 5

Q3. Test the divisibility of each of the following numbers by 10:

i. 205

Solution: we know that if the unit place digit is divisible by 10 i.e. the unit place is having the value 0 then given number is divisible by 10.

Here, the unit place of the given number is 5 which is not divisible by 10

∴ the given number 205 is not divisible by 10

ii. 90

Solution: we know that if the unit place digit is divisible by 10 i.e. the unit place is having the value 0 then given number is divisible by 10.

Here, the unit place of the given number is 0 which is divisible by 10

∴ the given number 90 is divisible by 10

iii. 1174

Solution: we know that if the unit place digit is divisible by 10 i.e. the unit place is having the value 0 then given number is divisible by 10.

Here, the unit place of the given number is 4 which is not divisible by 10

∴ the given number 1174 is not divisible by 10

iv. 57930

Solution: we know that if the unit place digit is divisible by 10 i.e. the unit place is having the value 0 then given number is divisible by 10.

Here, the unit place of the given number is 0 which is divisible by 10

∴ the given number 57930 is divisible by 10

v. 60005

Solution: we know that if the unit place digit is divisible by 10 i.e. the unit place is having the value 0 then given number is divisible by 10.

Here, the unit place of the given number is 5 which is not divisible by 10

∴ the given number 60005 is not divisible by 10

Q4. Test the divisibility of each of the following numbers by 3:

i. 83

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 11, which is not divisible by 3

∴ the given number 83 is not divisible by 3

ii. 378

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 18, which is divisible by 3

∴ the given number 378 is divisible by 3

iii. 474

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 15, which is divisible by 3

∴ the given number 474 is divisible by 3

iv. 1693

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 19, which is not divisible by 3

∴ the given number 1693 is not divisible by 3

v. 20345

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 14, which is not divisible by 3

∴ the given number 20345 is not divisible by 3

vi. **67035**

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 21, which is divisible by 3

∴ the given number 67035 is divisible by 3

vii. **591282**

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 27, which is divisible by 3

∴ the given number 591282 is divisible by 3

viii. **903164**

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 23, which is not divisible by 3

∴ the given number 903164 is not divisible by 3

ix. **100002**

Solution: we know that the sum of digits of the number is divisible by 3 then the number is divisible by 3.

Sum of the digits is 3, which is divisible by 3

∴ the given number 100002 is divisible by 3

Q5. Test the divisibility of each of the following numbers by 9:

i. **327**

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 12, which is not divisible by 9

∴ the given number 327 is not divisible by 9

ii. **7524**

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 18, which is divisible by 9

••the given number 7524 is divisible by 9

iii. 32022

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 9, which is divisible by 9

••the given number 32022 is divisible by 9

iv. 64302

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 15, which is not divisible by 9

••the given number 64302 is not divisible by 9

v. 89361

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 27, which is divisible by 9

••the given number 89361 is divisible by 9

vi. 14799

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 30, which is not divisible by 9

••the given number 14799 is not divisible by 9

vii. 66888

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 36, which is divisible by 9

••the given number 66888 is divisible by 9

viii. 30006

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 9, which is divisible by 9

- the given number 30006 is divisible by 9

ix. 33333

Solution: we know that the sum of digits of the number is divisible by 9 then the number is divisible by 9.

Sum of the digits is 15, which is not divisible by 9

- the given number 33333 is not divisible by 9

Q6. Test the divisibility of each of the following numbers by 4:

i. 134

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 34, which is not divisible by 4

- the given number 134 is not divisible by 4

ii. 618

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 18, which is not divisible by 4

- the given number 618 is not divisible by 4

iii. 3928

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 28, which is divisible by 4

- the given number 3928 is divisible by 4

iv. 50176

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 76, which is divisible by 4

- the given number 50176 is divisible by 4

v. **39392**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 92, which is divisible by 4

∴ the given number 39392 is divisible by 4

vi. **56794**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 94, which is not divisible by 4

∴ the given number 56794 is not divisible by 4

vii. **86102**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 02, which is not divisible by 4

∴ the given number 86102 is not divisible by 4

viii. **66666**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 66, which is not divisible by 4

∴ the given number 66666 is not divisible by 4

ix. **99918**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 18, which is not divisible by 4

∴ the given number 99918 is not divisible by 4

x. **77736**

Solution: we know that if the number formed by last two digits of a given number is divisible by 4 then the whole number is divisible by 4.

The number formed by the last two digits is 36, which is divisible by 4

∴ the given number 77736 is divisible by 4

Q7. Test the divisibility of each of the following numbers by 8:**i. 6132**

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 132, which is not divisible by 8

∴ the given number 6132 is not divisible by 8

ii. 7304

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 304, which is divisible by 8

∴ the given number 7304 is divisible by 8

iii. 59312

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 312, which is divisible by 8

∴ the given number 59312 is divisible by 8

iv. 66664

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 664, which is divisible by 8

∴ the given number 66664 is divisible by 8

v. 44444

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 444, which is not divisible by 8

∴ the given number 44444 is not divisible by 8

vi. 154360

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 360, which is divisible by 8

••the given number 154360 is divisible by 8

vii. 998818

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 818, which is not divisible by 8

••the given number 998818 is not divisible by 8

viii. 265472

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 472, which is divisible by 8

••the given number 265472 is divisible by 8

ix. 7350162

Solution: we know that if the number formed by last three digits of a given number is divisible by 8 then the whole number is divisible by 8.

The number formed by the last three digits is 162, which is not divisible by 8

••the given number 7350162 is not divisible by 8

EXERCISE 5C

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Replace A, B, C by suitable numerals

1.

$$\begin{array}{r} 5 \ A \\ + 8 \ 7 \\ \hline C \ B \ 3 \end{array}$$

Solution: we know that in the unit place $A + 7 = 3$

$$A = 3 - 7 = -4, \text{ which is not possible}$$

Since A is greater than 10, where, 1 is carried over to tens place

$$\therefore A + 7 = 13$$

$$A = 13 - 7 = 6$$

Now in tens place

$$5 + 8 + 1 = B \text{ where 1 is carried over}$$

$$\therefore B = 14$$

Here, 1 is carried over to hundred's place

$$\therefore C = 1$$

2.

$$\begin{array}{r} 4 \ C \ B \ 6 \\ + 3 \ 6 \ 9 \ A \\ \hline 8 \ 1 \ 7 \ 3 \end{array}$$

Solution: we know that in the unit place $6 + A = 3$

$$A = 3 - 6 = -3, \text{ which is not possible}$$

Since A is greater than 10, where, 1 is carried over to tens place

$$\therefore 6 + A = 13$$

$$A = 13 - 6 = 7$$

Now in tens place

$$B + 9 + 1 = 7 \text{ where 1 is carried over}$$

$$B = 7 - 10 = -3, \text{ which is not possible}$$

Since B is greater than 10, where, 1 is carried over to hundred's place

$$B + 9 + 1 = 10 + 7$$

$$B = 17 - 10 = 7$$

$$\therefore B = 7$$

Now in hundred's place

$C + 6 + 1 = 1$ where, 1 is carried over

$C = 1 - 7 = -6$ which is not possible

Since C is greater than 10, where, 1 is carried over to hundred's place

$$C + 6 + 1 = 1 + 10$$

$$C = 11 - 7 = 4$$

$$\therefore C = 4$$

3.

$$\begin{array}{r} A \\ + A \\ + A \\ \hline B A \end{array}$$

Solution: we know that in the unit place $A + A + A = A$

$3A = A$, which is not possible

Since A is greater than 10, where, 1 is carried over to tens place

$$A + A + A = A + 10$$

$$3A = A + 10$$

$$3A - A = 10$$

$$2A = 10$$

$$\therefore A = 10/2 = 5$$

Now in tens place

$$\therefore B = 1 \text{ where } 1 \text{ is carried over}$$

4.

$$\begin{array}{r} 6 \ A \\ - \ A \ B \\ \hline 3 \ 7 \end{array}$$

Solution: In tens place

$$6 - A = 3$$

Which implies that $A \leq 3$

Now in units place

$$A - B = 7$$

This involves borrowing

∴ in tens place

$$6 - A - 1 = 3$$

$$\therefore A = 2$$

Now in units place

$$A + 10 - B = 7, \text{ where borrowing is involved}$$

$$2 + 10 - B = 7$$

$$12 - B = 7$$

$$12 - 7 = B$$

$$\therefore B = 5$$

5.

$$\begin{array}{r} C \ B \ 5 \\ - \ 2 \ 8 \ A \\ \hline 2 \ 5 \ 9 \end{array}$$

Solution: In unit place

$$5 - A = 9, \text{ this involves borrowing}$$

$$\text{i.e. } 10 + 5 - A = 9$$

$$15 - A = 9$$

$$15 - 9 = A$$

$$\therefore A = 6$$

Now in tens place, as 1 is borrowed from hundred's place as well as lent

$$B - 5 + 10 - 1 = 8$$

$$B = 8 - 4 = 4$$

$$\therefore B = 4$$

Now in hundred's place as 1 is lent

$$C - 2 - 1 = 2$$

$$\therefore C = 5$$

6.

$$\begin{array}{r} A \ B \\ \times \ 3 \\ \hline C \ A \ B \end{array}$$

Solution: Here, $(B \times 3) = B$

Wherein B can be either 0 or 5, which satisfies the above condition

If B is 5, then 1 can be carried

$A \times 3 + 1 = A$, this not be possible for any number

$$\therefore B = 0$$

Also, $A \times 3 = A$ is possible for either 0 or 5

If we consider $A=0$, then all the numbers will become 0 which is not possible

$$\therefore A = 5$$

So 1 will be carried over

$$\therefore C = 1$$

7.

$$\begin{array}{r} A \ B \\ \times \ B \ A \\ \hline (B+1) \ C \ B \end{array}$$

Solution: Here, $B \times A = A$ i.e. $A=1$

Now first digit $(B+1)$

Where 1 can be carried from $1+B^2$ and becomes $(B+1)(B^2-9)B$

$$\therefore C = B^2 - 1$$

Now B, $B+1$ and B^2-9 are one single digit

This condition is satisfied for $B=3$ or $B=4$

For $B < 3$, $B^2 - 9$ is negative

For $B > 3$, $B^2 - 9$ will become two digit number

For $B = 3$, $C = 3^2 - 9 = 9 - 9 = 0$

For $B = 4$, $C = 4^2 - 9 = 16 - 9 = 7$

∴ $A = 1$, $B = 3$, $C = 0$

$A = 1$, $B = 4$, $C = 7$



EXERCISE 5D

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Select the correct answer in each of the following

1. If $5x6$ is exactly divisible by 3, then the least value of x is

- a) 0
- b) 1
- c) 2
- d) 3

Solution: we know that the sum of the digits of a number is divisible by 3 then the whole number is divisible by 3

$$5+x+6 = \text{multiple of } 3$$

$$11+x = 0, 3, 6, 9, \dots$$

$$11+x = 12$$

$$\therefore x = 12 - 11 = 1$$

The least value of x is 1

2. If $64y8$ is exactly divisible by 3, then the least value of y is

- a) 0
- b) 1
- c) 2
- d) 3

Solution: we know that the sum of the digits of a number is divisible by 3 then the whole number is divisible by 3

$$6+4+y+8 = \text{multiple of } 3$$

$$18+y = 0, 3, 6, 9, \dots$$

$$18+y = 18$$

$$\therefore y = 18 - 18 = 0$$

The least value of y is 0

3. If $7x8$ is exactly divisible by 9, then the least value of x is

- a) 0
- b) 2
- c) 3
- d) 5

Solution: we know that the sum of the digits of a number is divisible by 9 then the whole number is divisible by 9

$$7+x+8 = \text{multiple of } 9$$

$$15+x= 0, 9, 18, 27....$$

$$15+x= 18$$

$$\therefore x=18-15 = 3$$

The least value of x is 3

4. If 37y4 is exactly divisible by 9, then the least value of y is

a) 2

b) 3

c) 1

d) 4

Solution: we know that the sum of the digits of a number is divisible by 9 then the whole number is divisible by 9

$$3+7+y+4 = \text{multiple of } 9$$

$$14+y= 0, 9, 18, 27....$$

$$14+y= 18$$

$$\therefore y=18-14 = 4$$

The least value of y is 4