

Autumn Holiday Homework

1. Fill in the blanks:

i) The largest number of 5 digits is 99,999 and the smallest number of 6-digits is 100,000.

ii) The difference between the smallest number of four digits and the largest number of three digits =
 $1000 - 999 = 1$.

iii) Four lakhs sixty seven thousand three hundred six.
= 4,67,306 (In numeral form)
= 467,306 (In International System)
= Four hundred sixty seven thousand three hundred six (In International numeration)

iv) Thirteen lakhs forty-five
Ans- = 13,00,045 (In numeral form)
= 1300045 (In International System)
= One million Three hundred thousand fortyfive (In International numeration)

v) On subtracting one from the smallest four-digit number, we get 999 which is the largest three digit number.

2. Choose the correct answer.

i) Which is the smallest factor of 2314?

Sol- b) 1

ii) Which is the smallest odd composite number?

Sol- c) 9

iii) Which of the following is divisible by 2 but not by 4?

Sol- a) 102

iv) Find the smallest number which, when divided by 12, 15, 18, 24 and 36 leaves no remainder.

Sol- a) 360

v) Find the smallest number which, when increased by one is exactly divisible by 12, 18, 24, 32 and 40.

Sol- a) 1439

- vi) The product of two numbers is 19,200 and their HCF is 40.
Find their LCM.

Sol- $6) 480$

3. Write 428140625 by placing commas according to International System.

Sol- $428140625 = 428,140,625$

4. Take two digits 4 and 5. The smallest 4-digit number using the digits equal number of times is

Sol- $a) 4455$

5. Form the largest number with the digits 2, 3, 5, 9, 6 and 0 without repetition of any digit.

Sol- The given digits = 2, 3, 5, 9, 6, 0

The number that can be formed by these digits = 965320

6. Write the smallest and greatest numbers of 4-digits without repetition of any digit.

Sol- The smallest number that can be formed = 1023

The largest number that can be formed = 9876

7. Write the cardinal number of $F = \{\text{Whole numbers from 8 to 14}\}$

Sol- $F = \{\text{Whole numbers from 8 to 14}\}$

$= F = \{9, 10, 11, 12, 13\}$

$\therefore$ The cardinal number of the set is 5.

8. Solve the following.

i) $2y - 5 = -11$

Sol- $2y = -11 + 5$

$2y = -6$

$y = \frac{-6}{2} = -3$

ii) $5y - 3.5 = 10$

Sol- $5y = 10 + 3.5$

$5y = 13.5$

$y = \frac{13.5}{5} = 2.7$

$y = 2.7$

9. In an election two Candidates A and B are the only contestants. If Candidate A scored 932567 votes and candidate B scored 900235 votes, by how much margin did A win or lose the election?

Sol- Number of votes Candidate A scored = 932567

Number of votes Candidate B scored = 900235

The Candidate A won.

Candidate A won by $= 932567 - 900235$
 $= 32332$

∴ Candidate A won the election by 32,332 more votes.

10. Starting from the greatest 5-digit number, write the previous five numbers in descending order.

Sol- The greatest 5-digit number = 99999

The numbers in descending order = 99999, 99998, 99997, 99996, 99995.

11. Starting from the smallest 7 digit number, write the next four numbers in ascending order.

Sol- The smallest 7 digit number is = 1000000

The numbers in ascending order are = 1000000, 1000001, 1000002, 1000003, 1000004.

12. By rearranging the given numbers, evaluate:

i) $2 \times 487 \times 50$

ii) $25 \times 444 \times 4$

Sol- $2 \times 50 \times 487$

Sol- $25 \times 4 \times 444$

$= 100 \times 487$

$= 100 \times 444$

$= 48700$

$= 44400$

13. Evaluate using properties:

i) 548×98

Sol- $548 \times (100 - 2)$
 $= 548 \times 100 - 548 \times 2$
 $= 54800 - 1096$
 $= 53,704$

ii) 924×997

Sol- $924 \times (1000 - 3)$
 $= 924 \times 1000 - 924 \times 3$
 $= 924000 - 2772$
 $= 921,228$

iii) 3002×723

Sol- $(3000 + 2) \times 723$
 $= 3000 \times 723 + 2 \times 723$
 $= 2169000 + 1446$
 $= 21,70,446$

14. Add:

i) 259 and 214

Sol- $259 + 214$
 $= 473$

ii) -528 and -243

Sol- $-528 + (-243)$
 $= -528 - 243$
 $= -771$

iii) -623 and 326

Sol- $-623 + 326$
 $= -297$

15. Subtract:

i) -123 from 453

Sol- $453 - (-123)$
 $= 453 + 123$
 $= 576$

ii) -78 from -12

Sol- $-12 - (-78)$
 $= -12 + 78$
 $= 66$

iii) 329 from -124

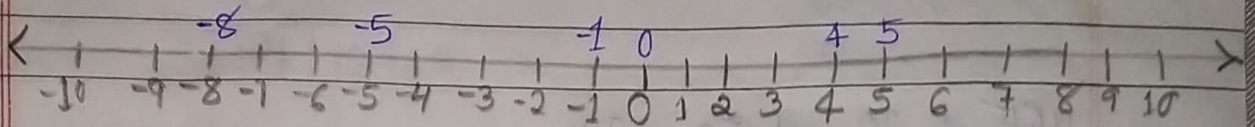
Sol- $-124 - 329$
 $= -453$

iv) -222 from 0

Sol- $0 - (-222)$
 $= 0 + 222$
 $= 222$

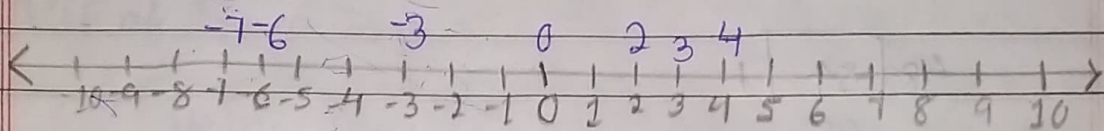
15. In each case, arrange the given integers in ascending order, using a number line:

i) $-8, 0, -5, 4, -1$



Ascending Order: $-8 < -5 < -1 < 0 < 4 < 5$

ii) $3, -3, 4, -7, 0, -6, 2$



Ascending Order: $-7 < -6 < -3 < 0 < 2 < 3 < 4$

16. Find the HCF of:

i) 5 and 8

Sol- 5 and 8 are coprime numbers.

$\therefore$ The HCF of 5 and 8 are - 1

ii) 24 and 49

Sol- 24 and 49 are coprime numbers.

$\therefore$ The HCF of 24 and 49 are - 1.

iii) 40, 60 and 80

Sol- HCF of 40 and 60 =

$$\begin{array}{r} 40 \overline{) 60} 1 \\ \underline{40} \\ 20 \overline{) 40} 2 \\ \underline{40} \\ 0 \end{array}$$

HCF of 40 and 60 is 20.

HCF of 20 and 80 is -

$$\begin{array}{r} 20 \overline{) 80} \quad | \quad 4 \\ \underline{-80} \\ 0 \end{array}$$

HCF of 20 and 80 is 20

∴ The HCF of 20, 80 and 40 is 20.

ii) 48, 84 and 88

Sol - HCF of 48 and 84 is -

$$\begin{array}{r} 48 \overline{) 84} \quad | \quad 1 \\ \underline{48} \\ 36 \overline{) 48} \quad | \quad 1 \\ \underline{36} \\ 12 \overline{) 36} \quad | \quad 3 \\ \underline{36} \\ 0 \end{array}$$

HCF of 48 and 84 is 12.

HCF of 12 and 88 is -

$$\begin{array}{r} 12 \overline{) 88} \quad | \quad 7 \\ \underline{84} \\ 4 \overline{) 12} \quad | \quad 3 \\ \underline{12} \\ 0 \end{array}$$

HCF of 12 and 88 is 4

∴ HCF of 48, 84 and 88 is 4.

v) 12, 16 and 28
Sol-

$$\begin{array}{r} 12 \overline{) 16} \quad 1 \\ \underline{-12} \\ 4 \overline{) 12} \quad 3 \\ \underline{-12} \\ 0 \end{array}$$

HCF of 12 and 16 is ~~12~~ 4.

HCF of ~~4~~ and 28 is -

$$\begin{array}{r} 4 \overline{) 28} \quad 7 \\ \underline{-28} \\ 0 \end{array}$$

$$\begin{array}{r} 4 \overline{) 28} \quad 7 \\ \underline{-28} \\ 0 \end{array}$$

HCF of ~~4~~ and 28 is 4

$\therefore$ HCF of 12, 16 and 28 is 4.

17. The HCF and LCM of two numbers are 50 and 300 respectively. If one of the numbers is 150, find the other one.

Sol- HCF of the numbers = 50

LCM of the numbers = 300

Relationship = The product of the two numbers = The product of HCF and LCM

Product of HCF and LCM = $50 \times 300 = 15000$

One of the numbers = 150

Other number = $\frac{15000}{150}$

$\therefore$ The other number = 100.

18. The product of two numbers is 432 and their LCM is 72.
Find their HCF.

Sol- The product of two numbers = 432
LCM = 72

~~HCF~~ Relationship = The product of the two numbers = The product of HCF and LCM

$$HCF = \frac{432}{72}$$

∴ The HCF of two numbers = 6

19. Write the degree of each of the following polynomials:

i) $x + x^2$

Sol- The degree of polynomial is 2.

ii) $5x^2 - 7x + 2$

Sol- The degree of polynomial is 2.

iii) $x^3 - x^8 + x^{10}$

Sol- The degree of polynomial is 10.

iv) $1 - 100x^2$

Sol- The degree of polynomial is 2.

20. State the numeral coefficient of the following monomials:

i) $5xy$

Sol- The numeral coefficient is 5

ii) abc

Sol- The numeral coefficient is 1.

iii) $5pqr$

Sol- The numeral coefficient is 5.

iv) $-2mly$

Sol- The numeral coefficient is -2.

21. Without making any actual division show that 2300023 is divisible by 23.

$$\begin{aligned}\text{Sol- } 2300023 &= 2300000 + 23 \\ &= 23 \times (100000 + 1) \\ &= 23 \times 100001\end{aligned}$$

$\therefore 2300023$ is clearly divisible by 23.

22. Without making any actual division, show that each of the following numbers is divisible by 11.

i) 11001

$$\begin{aligned}\text{Sol- } 11001 &= 11000 + 11 \\ &= 11 \times (1000 + 1) \\ &= 11 \times 1001\end{aligned}$$

$\therefore 11001$ is clearly divisible by 11.

ii) 110011

$$\begin{aligned}\text{Sol- } 110011 &= 110000 + 11 \\ &= 11 \times (10000 + 1) \\ &= 11 \times 10001\end{aligned}$$

$\therefore 110011$ is clearly divisible by 11.

iii) 11000011

$$\begin{aligned}\text{Sol- } 11000011 &= 11000000 + 11 \\ &= 11 \times (1000000 + 1) \\ &= 11 \times 1000001\end{aligned}$$

$\therefore 11000011$ is clearly divisible by 11.

23. Without actual division, show that each of the following numbers is divisible by 8.

i) 1608

$$\begin{aligned}\text{Sol- } 1608 &= 1600 + 8 \\ &= 8 \times (200 + 1) \\ &= 8 \times 201\end{aligned}$$

$\therefore 1608$ is clearly divisible by 8.

ii) 56008

Sol- $56008 = 56000 + 8$
 $= 8 \times (7000 + 1)$
 $= 8 \times 7001$

$\therefore 56008$ is clearly divisible by 8.

iii) 240008

Sol- $240008 = 240000 + 8$
 $= 8 \times (30000 + 1)$
 $= 8 \times 30001$

$\therefore 240008$ is clearly divisible by 8.

24. Find which of the following numbers are divisible by 2:

i) 352

Sol- The given number = 352

The digit at the unit's place = 2

2 is an even number, so it is divisible by 2.

$\therefore 352$ is divisible by 2.

ii) 523

Sol- The given number = 523

The digit at the unit's place = 3

3 is an odd number, so it is not divisible by 2.

$\therefore 523$ is not divisible by 2.

iii) 496

Sol- The given number = 496

The digit at the unit's place = 6

6 is an even number, so it is divisible by 2.

$\therefore 496$ is divisible by 2.

iv) 649

Sol- The given number = 649

The digit at the unit's place = 9

~~The~~ 9 is an odd number so it is ^{not} divisible by 2.

$\therefore 649$ is not divisible by 2.

25. Find which of the following numbers are divisible by 10:

i) 9990

Sol- The given number = 9990
The digit at the unit place = 0
 $\therefore$ 9990 is divisible by 10.

ii) 0

Sol- The given number = 0
The digit at the unit place = 0
 $\therefore$ 0 is divisible by 10.

iii) 847

Sol- The given number = 847
The digit at the unit place = 7
 $\therefore$ 847 is not divisible by 10.

iv) 8976

Sol- The given number = 8976
The digit at the unit place = 6
 $\therefore$ 8976 is not divisible by 10.

26. Find which of the following numbers are divisible by 11:

i) 5918

Sol- The given number = 5918

Divisibility rule of 11 = ~~If~~ A number is divisible by 11 if the ~~sum~~ difference of sum of its digits in odd places from the right side and the sum of its digits in even places from the right side is divisible by 11.

The sum of the digits at odd places = $1 + 5 = 6$

The sum of the digits at even places = $8 + 9 = 17$

Their difference = $17 - 6 = 11$, which is divisible by 11.
 $\therefore$ 5918 is divisible by 11.

ii) 68,717

Sol- The given number = 68,717

The sum of digits at odd places = $7 + 7 + 6 = 20$

The sum of digits at even places = ~~$6 + 8 + 1$~~ $1 + 8 = 9$

Their difference = $20 - 9 = 11$, which is divisible by 11.

$\therefore$ 68,717 is divisible by 11.

iii) 3882

Sol- The given number = 3882

The sum of digits at odd places = $8 + 2 = 10$

The sum of digits at even places = $8 + 3 = 11$

Difference = $11 - 10 = 1$, which is not divisible by 11

$\therefore$ 3882 is not divisible by 11.

iv) 10857

Sol- The given number = 10857

The sum of digits at odd places = $1 + 8 + 7 = 16$

Sum of digits at even places = $0 + 5 = 5$

Difference = $16 - 5 = 11$, which is divisible by 11

$\therefore$ 10857 is divisible by 11.

27. In each of the following numbers, replace M by the smallest number to make resulting number divisible by 3:

i) 64M3

Sol- The given number = 64M3

Sum of its digit = $6 + 4 + 3 = 13$

The number next to 13 which is divisible by 3 is 15

Required smallest number = $15 - 13 = 2$

$\therefore$ M can be replaced by 2.

ii) 46M46

Sol- The given number = 46M46

Sum of its digits = $4 + 6 + 4 + 6 = 20$

The number next to 20 which is divisible by 3 is 21.

Required smallest number = $21 - 20 = 1$

$\therefore$ M can be replaced by 1.

ii) 27M53

Sol- ~~27M53~~

The given number = 27M53

Sum of its digits = $2 + 7 + 5 + 3 = 17$

The number next to 17 is 18

Required smallest = $18 - 17 = 1$

$\therefore$ M can be replaced by 1.

28. One pencil costs Rs 2 and one fountain pen costs Rs 15, what is the cost of x pencils and y fountain pens?

Ans- One pencil costs = Rs 2

One fountain pen costs = Rs 15

Total cost of x pencil is $2 \times x = 2x$

Total cost of y pencil is $15 \times y = 15y$

Total cost of x pencils and y fountain pens is $2x + 15y$.

$\therefore$ The total cost is $2x + 15y$

29. Think of a number. Multiply by 5. Add 6 to the result. Subtract y from this result. What is the result?

Sol- Let the number be x

A/a, The number will be multiplied by 5 = $x \times 5 = 5x$

Then, Add 6 to the result = $5x + 6$

Then, Subtract y from this result = $(5x + 6) - y$

So, the result will be $(5x + 6) - y$.

30. The number of rooms on the ground floor of a building is 12 less than the twice of the number of rooms on first floor. If the first floor has x rooms, how many rooms does the ground floor has?

Sol- Total number of rooms first floor has = x

Twice of the rooms on first floor = $2x$

The total number of rooms on the ground floor is $2x - 12$

$\therefore$ The ground floor has $2x - 12$ rooms.

31. One-fourth of a number added to two-seventh of it gives 135. find the number.

Sol- Let the number be x

A/q, $\frac{1}{4}x + \frac{2}{7}x = 135$

$$\Rightarrow \frac{7x + 8x}{28} = 135$$

$$\Rightarrow x = \frac{135 \times 28}{15}$$

$$\Rightarrow x = 9 \times 28$$

$$\Rightarrow x = 252$$

$\therefore$ The required number is 252.

32. A number is increased by 12 and the new number obtained is multiplied by 5. If the resulting number is 95, find the original number.

Sol- Let the number be x .

A/q, $(x + 12) \times 5 = 95$

$$\Rightarrow x + 12 = \frac{95}{5}$$

$$\Rightarrow x + 12 = 19$$

$$\Rightarrow x = 19 - 12$$

$$\Rightarrow x = 7$$

$\therefore$ The original number is 7.

33. A number is increased by 26 and the new number obtained is divided by 33. If the resulting number is 18, find the original number.

Sol- Let the number be x

A/q, $(x + 26) \div 33 = 18$

$$\Rightarrow x + 26 = 18 \times 33$$

$$\Rightarrow x + 26 = 594$$

$$\Rightarrow x = 594 - 26$$

$$\Rightarrow x = 568$$

$\therefore$ The original number = 568.

34. The age of a man is 27 years more than the age of his son. If the sum of their ages is 47 years, find the age of the son and his father.

Sol- Let the son's age be x .

Age of his father $= x + 27$

A/q, $x + x + 27 = 47$

$= 2x + 27 = 47$

$\Rightarrow 2x = 47 - 27$

$\Rightarrow 2x = 20$

$\Rightarrow x = \frac{20}{2} = 10$

So, the son's age $= x = 10$

So, the father's age $= x + 27 = 37$ years.

35. State, whether the following are finite or infinite sets:

i) $\{2, 4, 6, 8, \dots, 800\}$

Sol- It is a finite set.

ii) $\{\dots, -5, -4, -3, -2\}$

Sol- It is an infinite set.

iii) $\{x : x \text{ is an integer between } -60 \text{ and } 60\}$

Sol- It is a finite set.

iv) $\{\text{No. of electrical appliances working in your house}\}$

Sol- It is an infinite set.

v) $\{x : x \text{ is a whole number greater than } 20\}$

Sol- It is an infinite set.

36. For each statement, given below, write true or false:

i) $\{\dots, -8, -4, 0, 4, 8\}$ is a finite set.

Sol- The above statement is false.

ii) $\{-32, -28, -24, -20, \dots, 0, 4, 8, 16\}$ is an infinite set.

Sol- The above statement is false.

iii) $\{x \mid x \text{ is a natural number less than } 1\}$ is the empty set

Sol- The above statement is true.

iv) $\{\text{Whole numbers between } 15 \text{ and } 16\} = \{\text{Natural numbers between } 5 \text{ and } 6\}$

Sol- The above statement is true.

v) $\{\text{odd numbers divisible by } 2\}$ is the empty set.

Sol- The above statement is true.

37. State giving reasons, which of the following pairs of sets are disjoint sets and which are overlapping sets:

i) $A = \{\text{Girls with ages below } 15 \text{ years}\}$ and $B = \{\text{Girls with ages above } 15 \text{ years}\}$

Sol- These sets are disjoint sets because no girl can both of age below 15 years and above 15 years.

ii) $C = \{\text{Boys with ages above } 20 \text{ years}\}$ and $D = \{\text{Boys with ages above } 27 \text{ years}\}$

Sol- The sets are overlapping sets because boys can be above 27 years and also above 20 years.

iii) $A = \{\text{Natural numbers between } 35 \text{ and } 60\}$ and $B = \{\text{Natural numbers between } 50 \text{ and } 80\}$

Sol- Overlapping sets, as natural numbers from 50 to 59 are common in both the sets.

iv) $P = \{\text{Students of class IX studying in I.C.S.E board}\}$ and $Q = \{\text{Students of class IX}\}$

Sol- Overlapping sets; as students of class IX studying in I.C.S.E board are common.

v) $A = \{\text{Natural number multiples of } 3 \text{ and less than } 30\}$ and $B = \{\text{Natural numbers divisible by } 4 \text{ and between } 20 \text{ and } 45\}$

Sol- Overlapping sets; as natural number 24 is common to both the sets.

38. Write the cardinal number of each of the following sets :

i) $A = \{0, 1, 2, 4\}$

Sol- $n(A) = 4$

ii) $B = \{-3, -1, 1, 3, 5, 7\}$

Sol- $n(B) = 6$

iii) $C = \{\}$

Sol- $n(C) = 0$

iv) $D = \{3, 2, 2, 1, 3, 1, 2\}$

Sol- $n(D) = 3$

v) $E = \{\text{Natural numbers between 15 and 20}\}$

Sol- $E = \{16, 17, 18, 19\}$

$n(E) = 4$

39. How many perpendicular bisectors are there for a line segment of length 12 cm.

Sol- Only one perpendicular bisector is there for a line segment of length 12 cm.

40. How many lines can pass through two points in a plane?

Sol- Only one line can pass through two points in a plane.