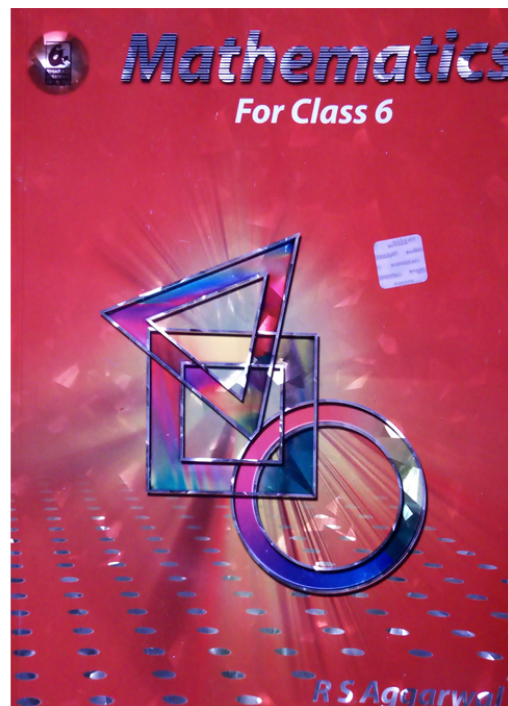


RS Aggarwal Solutions for Class 6 Maths

Chapter 2–Factors and Multiples

Class 6 - Chapter 2 Factors and Multiples



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RS Aggarwal Solutions for Class 6

Maths Chapter 2–Factors and Multiples

Class 6: Maths Chapter 2 solutions. Complete Class 6 Maths Chapter 2 Notes.

RS Aggarwal Solutions for Class 6 Maths Chapter 2–Factors and Multiples

RS Aggarwal 6th Maths Chapter 2, Class 6 Maths Chapter 2 solutions

Ex 2A Solutions

Question 1.

Solution:

(i) A factor of a number is an exact divisor of that number.

Examples : 1. 2 is a factor of 8

2. 5 is a factor of 15

3. 9 is a factor of 27

4. 4 is a factor of 20

5. 3 is a factor of 12.

(ii) Multiple. A number is said to be a multiple of any of its factors.

Examples : 1. 15 is a multiple of 3

2. 8 is a multiple of 4

3. 10 is a multiple of 2

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4. 25 is a multiple of 5

5. 18 is a multiple of 9.

Question 2.

Solution:

(i) We know that

$$20 = 1 \times 20, 20 = 2 \times 10, 20 = 4 \times 5$$

which shows that the numbers 1, 2, 4, 5, 10, 20 exactly divide 20.

1, 2, 4, 5, 10 and 20 are all factors of 20

(ii) We know that

$$36 = 1 \times 36, 36 = 2 \times 18, 36 = 3 \times 12, 36 = 4 \times 9, 36 = 6 \times 6$$

This shows that each of the numbers 1, 2, 3, 4, 6, 9, 12, 18, 36 exactly divides 36.

1, 2, 3, 4, 6, 9, 12, 18, 36 are the factors of 36.

(iii) We know that

$$60 = 1 \times 60, 60 = 2 \times 30, 60 = 3 \times 20, 60 = 4 \times 15, 60 = 5 \times 12, 60 = 6 \times 10$$

This shows that each of the numbers 1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 exactly divides 60.

1, 2, 3, 4, 5, 6, 10, 12, 15, 20, 30, 60 are all the factors of 60.

(iv) We know that

$$75 = 1 \times 75, 75 = 3 \times 25, 75 = 5 \times 15$$

This shows that each of the numbers 1, 3, 5, 15, 25, 75 exactly divides 75.

1, 3, 5, 15, 25, 75 are all the factors of 75.

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Question 3.**Solution:**

(i) First five multiples of 17 are :

$$17 \times 1 = 17$$

$$17 \times 2 = 34$$

$$17 \times 3 = 51$$

$$17 \times 4 = 68$$

$$17 \times 5 = 85$$

(ii) First five multiples of 23 are :

$$23 \times 1 = 23$$

$$23 \times 2 = 46$$

$$23 \times 3 = 69$$

$$23 \times 4 = 92$$

$$23 \times 5 = 115$$

(iii) First five multiples of 65 are :

$$65 \times 1 = 65$$

$$65 \times 2 = 130$$

$$65 \times 3 = 195$$

$$65 \times 4 = 260$$

$$65 \times 5 = 325$$

(iv) First five multiples of 70 are :

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$$70 \times 1 = 70$$

$$70 \times 2 = 140$$

$$70 \times 3 = 210$$

$$70 \times 4 = 280$$

$$70 \times 5 = 350$$

Question 4.**Solution:**

- (i) 32 is a multiple of 2, so it is an even number.
- (ii) 37 is not a multiple of 2, so it is an odd number.
- (iii) 50 is a multiple of 2, so it is an even number.
- (iv) 58 is a multiple of 2, so it is an even number.
- (v) 69 is not a multiple of 2, so it is an odd number.
- (vi) 144 is a multiple of 2, so it is an even number.
- (vii) 321 is not a multiple of 2, so it is an odd number.
- (viii) 253 is not a multiple of 2, so it is an odd number.

Question 5.**Solution:**

Prime Numbers. Each of the numbers which has exactly two factors, namely 1 and itself, is called a prime number.

Examples. The numbers 2, 3, 5, 7, 11, 13, 17, 19, 23, 29 are all prime numbers.

Question 6.

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Solution:

- (i) Prime numbers between 10 and 40 are: 11, 13, 17, 19, 23, 29, 31, 37.
- (ii) Prime numbers between 80 and 100 are : 83, 89, 97.
- (iii) Prime numbers between 40 and 80 are : 41, 43, 47, 53, 59, 61, 67, 71, 73, 79
- (iv) Prime numbers between 30 and 40 are : 31, 37.

Question 7.**Solution:**

- (i) 2 is the smallest prime number.
- (ii) 2 is the only even prime number.
- (iii) 3 is the smallest odd prime number.

Question 8.**Solution:**

- (i) We know that

$$87 = 1 \times 87, 87 = 3 \times 29$$

This shows that 1, 3, 29, 87 are the factors of 87.

The number 87 is not a prime number as it has more than 2 factors.

- (ii) We have $89 = 1 \times 89$

The number 89 is a prime number as it has only 2 factors.

- (iii) We have $63 = 1 \times 63, 63 = 3 \times 21,$

$$63 = 7 \times 9$$

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This shows that the number 63 has more than 2 factors namely 1, 3, 7, 9, 21, 63. So, it is not a prime number.

(iv) We have $91 = 1 \times 91$, $91 = 7 \times 13$ This shows that the number 91 has more than 2 factors namely 1, 7, 13, 91.

So, it is not a prime number.

Question 9.

Solution:

From the Sieve of Eratosthenes, we see that the seven consecutive numbers are 90, 91, 92, 93, 94, 95 and 96

Question 10.

Solution:

(i) There is no counting number having no factor at all.

(ii) The number 1 has exactly one factor.

(iii) The numbers between 1 and 100 having exactly three factors are : 4, 9, 25, 49.

Question 11.

Solution:

Composite Numbers. Numbers having more than two factors are called composite numbers. A composite number can be an odd number. The smallest odd composite number is 9.

Question 12.

Solution:

Twin-primes. Two consecutive odd prime numbers are known as twin- primes.

The prime numbers between 50 and 100 are:

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53, 59, 61, 67, 71, 73, 79, 83, 89, 97

From above pairs of twin-primes are (59, 61), (71, 73)

Question 13.

Solution:

Co-primes. Two numbers are said to be co-prime if they do not have a common factor.

Examples. Five pairs of co-primes are:

(i) 2, 3

(ii) 3, 4

(iii) 4, 5

(iv) 8, 15

(v) 9, 16

Co-primes are not always prime.

Illustration. In the pair (3, 4) of co-primes, 3 is a prime number whereas 4 is a composite number.

Question 14.

Solution:

(i) $36 = 7 + 29$

(ii) $42 = 5 + 37$

(iii) $84 = 17 + 67$

(iv) $98 = 19 + 79$

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Question 15.**Solution:**

(i) $31 = 5 + 7 + 19$

(ii) $35 = 5 + 7 + 23$

(iii) $49 = 3 + 5 + 41$

(iv) $63 = 7 + 13 + 43$

Question 16.**Solution:**

(i) $36 = 17 + 19$

(ii) $84 = 41 + 43$

(iii) $120 = 59 + 61$

(iv) $144 = 71 + 73$

Question 17.**Solution:**

(i) to (iv). None of the given statements is true.

Ex 2B Solutions**Question 1.****Solution:**

(i) The given number = 2650

Digit at unit's place = 0

It is divisible by 2.

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(ii) The given number = 69435

Digit at unit's place = 5

It is not divisible by 2.

(iii) The given number = 59628

Digit at unit's place = 8

It is divisible by 2.

(iv) The given number = 789403

Digit at unit's place = 3

It is not divisible by 2.

(v) The given number = 357986

Digit at unit's place = 6

It is divisible by 2.

(vi) The given number = 367314

Digit at unit's place = 4

It is divisible by 2.

Question 2.

Solution:

(i) The given number = 733

Sum of its digits = $7 + 3 + 3 = 13$,

which is not divisible by 3.

$\therefore$ 733 is not divisible by 3.

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(ii) The given number = 10038

Sum of its digits = $1 + 0 + 0 + 3 + 8 = 12$,

which is divisible by 3

$\therefore$ 10038 is divisible by 3.

(iii) The given number = 20701

Sum of its digits = $2 + 0 + 7 + 0 + 1 = 10$,

which is not divisible by 3

$\therefore$ 20701 is not divisible by 3.

(iv) The given number = 524781

Sum of its digits = $5 + 2 + 4 + 7 + 8 + 1 = 27$,

which is divisible by 3

$\therefore$ 524781 is divisible by 3.

(v) The given number = 79124

Sum of its digits = $7 + 9 + 1 + 2 + 4 = 23$,

which is not divisible by 3

$\therefore$ 79124 is not divisible by 3.

(vi) The given number = 872645

Sum of its digits = $8 + 7 + 2 + 6 + 4 + 5 = 32$,

which is not divisible by 3

$\therefore$ 872645 is not divisible by 3.

Question 3.

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Solution:

(i) The given number = 618

The number formed by ten's and unit's digits is 18, which is not divisible by 4.

∴ 618 is not divisible by 4.

(ii) The given number = 2314

The number formed by ten's and unit's digits is 14, which is not divisible by 4.

∴ 2314 is not divisible by 4.

(iii) The given number = 63712

The number formed by ten's and unit's digits is 12, which is divisible by 4.

∴ 63712 is divisible by 4.

(iv) The given number = 35056

The number formed by ten's and unit's digits is 56, which is divisible by 4.

∴ 35056 is divisible by 4.

(v) The given number = 946126

The number formed by ten's and unit's digits is 26, which is not divisible by 4.

∴ 946126 is not divisible by 4.

(vi) The given number = 810524

The number formed by ten's and unit's digits is 24, which is divisible by 4.

∴ 810524 is divisible by 4.

Question 4.**Solution:**

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We know that a number is divisible by 5 if its ones digit is 0 or 5

(i) 4965, (ii) 23590 (iv) 723405 and (vi) 438750 are divisible by 5

Question 5.

Solution:

(i) The given number = 2070

Its unit's digit = 0

So, it is divisible by 2

Sum of its digits = $2 + 0 + 7 + 0 = 9$,

which is divisible by 3

∴ The given number is divisible by 3.

So, 2070 is divisible by both 2 and 3.

Hence it is divisible by 6.

(ii) The given number = 46523

Its unit's digit = 3

So, it is not divisible by 2

Hence 46523 is not divisible by 6.

(iii) The given number = 71232

Its unit's digit = 2

So, it is divisible by 2

Sum of its digits = $7 + 1 + 2 + 3 + 2$

= 15, which is divisible by 3

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$\therefore$ 71232 is divisible by both 2 and 3

Hence it is divisible by 6.

(iv) The given number = 934706

Its unit's digit = 6 So,

it is divisible by 2

Sum of its digits = $9 + 3 + 4 + 7 + 0 + 6 = 29$,

which is not divisible by 3

Hence 934706 is not divisible by 6.

(v) The given number = 251780

Its unit's digit = 0

So, it is divisible by 2

Sum of its digits = $2 + 5 + 1 + 7 + 8 + 0 = 23$,

which is not divisible by 3

251780 is not divisible 6

(vi) 872536 is not divisible by 6 as sum of its digits is $8 + 7 + 2 + 5 + 3 + 6 = 31$ which is not divisible by 3

Question 6.

Solution:

We know that a number is divisible by 7 if the difference between twice the ones digit and the number formed by the other digits is either 0 or a multiple of 7

(i) 826, $6 \times 2 = 12$ and 82

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Difference between 82 and 12 = 70

Which is divisible by 7

∴ 826 is divisible by 7

(ii) In 117, $7 \times 2 = 14$, 11

Difference between 14 and 11 = $14 - 11 = 3$

Which is not divisible by 7

∴ 117 is not divisible by 7

(iii) In 2345, $5 \times 2 = 10$ and 234

Difference between 234 – 10 = 224

which is divisible by 7

∴ 2345 is divisible by 7

(iv) In 6021, $1 \times 2 = 2$, and 602

Difference between 602 and 2 = 600

which is not divisible by 7

∴ 6021 is not divisible by 7

(v) In 14126, $6 \times 2 = 12$ and 1412

Difference between 1412 – 12 = 1400

which 8 is divisible by 7

∴ 14126 is divisible by 7

(vi) In 25368, $8 \times 2 = 16$ and 2536

Difference between 2536 and 16 = 2520

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which is divisible by 7

∴ 25368 is divisible by 7

Question 7.

Solution:

(i) The given number = 9364

The number formed by hundred's, ten's and unit's digits is 364, which is not divisible by 8.

∴ 9364 is not divisible by 8.

(ii) The given number = 2138

The number formed by hundred's, ten's and unit's digits is 138, which is not divisible by 8.

∴ 2138 is not divisible by 8.

(iii) The given number = 36792

The number formed by hundred's, ten's and unit's digits is 792, which is divisible by 8.

∴ 36792 is divisible by 8.

(iv) The given number = 901674

The number formed by hundred's, ten's and unit's digits is 674, which is not divisible by 8.

∴ 901674 is not divisible by 8.

(v) The given number = 136976

The number formed by hundred's, ten's and unit's digits is 976, which is divisible by 8.

∴ 136976 is divisible by 8.

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(vi) The given number = 1790184

The number formed by hundred's, ten's and unit's digits is 184, which is divisible by 8.

∴ 1790184 is divisible by 8.

Question 8.

Solution:

We know that a number is divisible by 9, if the sum of its digits is divisible by 9

(i) In 2358

Sum of digits : $2 + 3 + 5 + 8 = 18$

which is divisible by 9

∴ 2358 is divisible by 9

(ii) In 3333

Sum of digits $3 + 3 + 3 + 3 = 12$

which is not divisible by 9

∴ 3333 is not divisible by 9

(iii) In 98712

Sum of digits = $9 + 8 + 7 + 1 + 2 = 27$

Which is divisible by 9

∴ 98712 is divisible by 9

(iv) In 257106

Sum of digits = $2 + 5 + 7 + 1 + 0 + 6 = 21$

which is not divisible by 9

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∴ 257106 is not divisible by 9

(v) In 647514

Sum of digits = $6 + 4 + 7 + 5 + 1 + 4 = 27$

which is divisible by 9

∴ 647514 is divisible by 9

(v) In 326999

Sum of digits = $3 + 2 + 6 + 9 + 9 + 9 = 38$

which is not divisible by 9

∴ 326999 is not divisible by 9

Question 9.

Solution:

We know that a number is divisible by 10 if its ones digit is 0

∴ (i) 5790 is divisible by 10

Question 10.

Solution:

(i) The given number = 4334

Sum of its digits in odd places = $4 + 3 = 7$

Sum of its digits in even places = $3 + 4 = 7$

Difference of the two sums = $7 - 7 = 0$

∴ 4334 is divisible by 11.

(ii) The given number = 83721

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Sum of its digits in odd places = $1 + 7 + 8 = 16$

Sum of its digits in even places = $2 + 3 = 5$

Difference of the two sums = $16 - 5 = 11$,

which is multiple of 11.

∴ 83721 is divisible by 11.

(iii) The given number = 66311

Sum of its digits in odd places = $1 + 3 + 6 = 10$

Sum of its digits in even places = $1 + 6 = 7$

Difference of the two sums = $10 - 7 = 3$,

which is not a multiple of 11.

∴ 66311 is not divisible by 11.

(iv) The given number = 137269

Sum of its digits in odd places = $9 + 2 + 3 = 14$

Sum of its digits in even places = $6 + 7 + 1 = 14$

Difference of the two sums = $14 - 14 = 0$

∴ 137269 is divisible by 11.

(v) The given number = 901351

Sum of its digits in odd places = $1 + 3 + 0 = 4$

Sum of its digits in even places = $5 + 1 + 9 = 15$

Difference of the two sums = $15 - 4 = 11$,

which is a multiple of 11.

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∴ 901351 is divisible by 11.

(vi) The given number = 8790322

Sum of its digits in odd places = $2 + 3 + 9 + 8 = 22$

Sum of its digits in even places = $2 + 0 + 7 = 9$

Difference of the two sums = $22 - 9 = 13$,

which is not a multiple of 11.

∴ 8790322 is not divisible by 11.

Question 11.

Solution:

(i) The given number = 27×4

Sum of its digits = $2 + 7 + 4 = 13$

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

∴ Required smallest number = $15 - 13$

= 2.

(ii) The given number = 53×46

Sum of the given digits = $5 + 3 + 4 + 6 = 18$,

which is divisible by 3.

∴ Required smallest number = 0.

(iii) The given number = 8×711

Sum of the given digits = $8 + 7 + 1 + 1 = 17$

The number next to 17,

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which is divisible by 3 is 18.

∴ Required smallest number = $18 - 17 = 1$

(iv) The given number = 62×35

Sum of the given digits = $6 + 2 + 3 + 5 = 16$

The number next to 16,

which is divisible by 3 is 18.

∴ Required smallest number = $18 - 16 = 2$

(v) The given number = 234×17

Sum of the given digits = $2 + 3 + 4 + 1 + 7 = 17$

The number next to 17, which is divisible by 3 is 18.

Required smallest number = $18 - 17 = 1$.

(vi) The given number = 6×1054

Sum of the given digits = $6 + 1 + 0 + 5 + 4 = 16$

The number next to 16,

which is divisible by 3 is 18.

Required smallest number = $18 - 16 = 2$.

Question 12.

Solution:

(i) The given number = 65×5

Sum of its given digits = $6 + 5 + 5 = 16$

The number next to 16, which is divisible by 9 is 18.

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∴ Required smallest number = $18 - 16 = 2$

(ii) The given number = $2*135$

Sum of its given digits = $2 + 1 + 3 + 5$

The number next to 11, which is divisible by 9 is 18.

∴ Required smallest number = $18 - 11 = 7$.

(iii) The given number = $6702*$

Sum of its given digits = $6 + 7 + 0 + 2 = 15$

The number next to 15, which is divisible by 9 is 18.

∴ Required smallest number = $18 - 15 = 3$

(iv) The given number = $91*67$

Sum of its given digits = $9 + 1 + 6 + 7 = 23$

The number next to 23, which is divisible by 9 is 27.

∴ Required smallest number = $27 - 23 = 4$.

(v) The given number = $6678*1$

Sum of its given digits = $6 + 6 + 7 + 8 + 1 = 28$

The number next to 28, which is divisible by 9 is 36.

∴ Required smallest number = $36 - 28 = 8$.

(vi) The given number = $835*86$

Sum of its given digits = $8 + 3 + 5 + 8 + 6 = 30$

The number next to 30, which is divisible by 9 is 36.

∴ Required smallest number = $36 - 30 = 6$.

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Question 13.**Solution:**

(i) The given number = $26*5$

Sum of its digits in odd places = $5 + 6 = 11$

Sum of its digits in even places = $* + 2$

Difference of the two sums = $11 - (* + 2)$

The given number will be divisible by 11 if the difference of the two sums = 0.

$$\therefore 11 - (* + 2) = 0$$

$$11 = * + 2$$

$$11 - 2 = *$$

$$9 = *$$

Required smallest number = 9.

(ii) The given number = $39*43$

Sum of its digits in odd places

$$= 3 + * + 3 = * + 6$$

Sum of its digits in even places = $4 + 9 = 13$

Difference of the two sums = $* + 6 - 13 = * - 7$

The given number will be divisible by 11, if the difference of the two sums = 0.

$$\therefore * - 7 = 0$$

$$* = 7$$

$\therefore$ Required smallest number = 7.

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(iii) The given number = $86*72$

Sum of its digits in odd places

$$= 2 + * + 8 = * + 10$$

$$\text{Sum of its digits in even places} = 7 + 6 = 13$$

$$\text{Difference of the two sums} = * + 10 - 13 = * - 3$$

The given number will be divisible by 11, if the difference of the two sums = 0.

$$\therefore * - 3 = 0$$

$$* = 3$$

$\therefore$ Required smallest number = 3.

(iv) The given number = $467*91$

$$\text{Sum of its digits in odd places} = 1 + * + 6 = * + 7$$

$$\text{Sum of its digits in even places} = 9 + 7 + 4 = 20$$

Difference of the two sums

$$= 20 - (* + 7)$$

$$= 20 - * - 7 = 13 - *$$

Clearly the difference of the two sums will be multiple of 11 if $13 - * = 11$

$$\therefore 13 - 11 = *$$

$$2 = *$$

$$* = 2$$

$\therefore$ Required smallest number = 2.

(v) The given number = $1723*4$

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Sum of its digits in odd places = $4 + 3 + 7 = 14$

Sum of its digits in even places = $* + 2 + 1 = * + 3$

Difference of the two sums = $* + 3 - 14 = * - 11$

The given number will be divisible by 11, if $* - 11$ is a multiple of 11, which is possible if $* = 0$.

Required smallest number = 0.

(vi) The given number = $9*8071$

Sum of its digits in odd places = $1 + 0 + * = 1 + *$

Sum of its digits in even places = $7 + 8 + 9 = 24$

Difference of the two sums = $24 - 1 - * = 23 - *$

∴ The given number will be divisible by 11, if $23 - *$ is a multiple of 11, which is possible if $* = 1$.

∴ Required smallest number = 1.

Question 14.

Solution:

(i) The given number = 10000001

Sum of its digits in odd places

$$= 1 + 0 + 0 + 0 = 1$$

Sum of its digits in even places = $0 + 0 + 0 + 1 = 1$

Difference of the two sums = $1 - 1 = 0$

∴ The number 10000001 is divisible by 11.

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(ii) The given number = 19083625

Sum of its digits in odd places

$$= 5 + 6 + 8 + 9 = 28$$

$$\text{Sum of its digits in even places} = 2 + 3 + 0 + 1 = 6$$

$$\text{Difference of the two sums} = 28 - 6 = 22,$$

which is divisible by 11.

$\therefore$ The number 19083625 is divisible by 11.

(iii) The given number = 2134563

Sum of its digits

$$= 2 + 1 + 3 + 4 + 5 + 6 + 3 = 24,$$

which is not divisible by 9.

$\therefore$ The number 2134563 is not divisible by 9.

(iv) The given number = 10001001

Sum of its digits

$$= 1 + 0 + 0 + 0 + 1 + 0 + 0 + 1 = 3,$$

which is divisible by 3.

$\therefore$ The number 10001001 is divisible by 3.

(v) The given number = 10203574

The number formed by its ten's and unit's digits is 74, which is not divisible by 4.

The number 10203574 is not divisible by 4.

(vi) The given number = 12030624

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The number formed by its hundred's, ten's and unit's digits = 624,
which is divisible by 8.

∴ The number 12030624 is divisible by

Question 15.

Solution:

103, 137, 179, 277, 331, 397 are prime numbers.

Question 16.

Solution:

(i) 154

(ii) 612

(iii) 5112, 3816 etc.

(iv) 3426, 5142 etc.

Question 17.

Solution:

(i) False

(ii) True

(iii) False

(iv) True

(v) False

(vi) True

(vii) True

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(viii) True

Ex 2C Solutions

Give the prime factorization of each of the following numbers.

Question 1.

Solution:

We have

$$\begin{array}{r|l} 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 12 = 2 \times 2 \times 3 = 2^2 \times 3.$$

Question 2.

Solution:

We have

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

$$\therefore 18 = 2 \times 3 \times 3 = 2 \times 3^2$$

Question 3.

Solution:

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We have

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

$$\therefore 48 = 2 \times 2 \times 2 \times 2 \times 3$$

$$= 2^4 \times 3.$$

Question 4.

Solution:

We have

$$\begin{array}{r|l} 2 & 56 \\ \hline 2 & 28 \\ \hline 2 & 14 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 56 = 2 \times 2 \times 2 \times 7$$

$$= 2^3 \times 7.$$

Question 5.

Solution:

We have

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$$\begin{array}{r|l} 2 & 90 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\therefore 90 = 2 \times 3 \times 3 \times 5$$

$$= 2 \times 3^2 \times 5.$$

Question 6.**Solution:**

We have

$$\begin{array}{r|l} 2 & 136 \\ \hline 2 & 68 \\ \hline 2 & 34 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$136 = 2 \times 2 \times 2 \times 17$$

$$= 2^3 \times 17.$$

Question 7.**Solution:**

We have

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$$\begin{array}{r|l} 2 & 252 \\ \hline 2 & 126 \\ \hline 3 & 63 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 252 = 2 \times 2 \times 3 \times 3 \times 7$$

$$= 2^2 \times 3^2 \times 7.$$

Question 8.

Solution:

We have

$$\begin{array}{r|l} 2 & 420 \\ \hline 2 & 210 \\ \hline 3 & 105 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\therefore 420 = 2 \times 2 \times 3 \times 5 \times 7$$

$$= 2^2 \times 3 \times 5 \times 7.$$

Question 9.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 7 & 637 \\ \hline 7 & 91 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\therefore 637 = 7 \times 7 \times 13$$

$$= 7^2 \times 13.$$

Question 10.

Solution:

We have

$$\begin{array}{r|l} 3 & 945 \\ \hline 3 & 315 \\ \hline 3 & 105 \\ \hline 5 & 21 \\ \hline 7 & 3 \\ \hline & 1 \end{array}$$

$$\therefore 945 = 3 \times 3 \times 3 \times 5 \times 7$$

$$= 3^3 \times 5 \times 7.$$

Question 11.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 2 & 1224 \\ \hline 2 & 612 \\ \hline 2 & 306 \\ \hline 3 & 153 \\ \hline 3 & 51 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\therefore 1224 = 2 \times 2 \times 2 \times 3 \times 3 \times 17$$

$$= 2^3 \times 3^2 \times 17.$$

Question 12.

Solution:

We have

$$\therefore 1323 = 3 \times 3 \times 3 \times 7 \times 7$$

$$= 3^3 \times 7^2$$

Question 13.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 2 & 8712 \\ \hline 2 & 4356 \\ \hline 2 & 2178 \\ \hline 3 & 1089 \\ \hline 3 & 363 \\ \hline 11 & 121 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\therefore 8712 = 2 \times 2 \times 2 \times 3 \times 3 \times 11 \times 11$$

$$= 2^3 \times 3^2 \times 11^2.$$

Question 14.

Solution:

We have

$$\begin{array}{r|l} 7 & 9317 \\ \hline 11 & 1331 \\ \hline 11 & 121 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\therefore 9317 = 7 \times 11 \times 11 \times 11$$

$$= 7 \times 11^3$$

Question 15.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 3 & 1035 \\ \hline 3 & 345 \\ \hline 5 & 115 \\ \hline 23 & 23 \\ \hline & 1 \end{array}$$

$$\therefore 1035 = 3 \times 3 \times 5 \times 23$$

$$= 3^2 \times 5 \times 23$$

Question 16.

Solution:

We have

$$\begin{array}{r|l} 3 & 1197 \\ \hline 3 & 399 \\ \hline 7 & 133 \\ \hline 19 & 19 \\ \hline & 1 \end{array}$$

$$\therefore 1197 = 3 \times 3 \times 7 \times 19$$

$$= 3^2 \times 7 \times 19$$

Question 17.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 3 & 4641 \\ \hline 7 & 1547 \\ \hline 13 & 221 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\therefore 4641 = 3 \times 7 \times 13 \times 17.$$

Question 18.

Solution:

We have

$$\begin{array}{r|l} 3 & 4335 \\ \hline 5 & 1445 \\ \hline 17 & 289 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\therefore 4335 = 3 \times 5 \times 17 \times 17$$

$$= 3 \times 5 \times 17^2$$

Question 19.

Solution:

We have

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r|l} 3 & 2907 \\ \hline 3 & 969 \\ \hline 17 & 323 \\ \hline 19 & 19 \\ \hline & 1 \end{array}$$

$$\therefore 2907 = 3 \times 3 \times 17 \times 19$$

$$= 3^2 \times 17 \times 19.$$

Question 20.

Solution:

We have

$$\begin{array}{r|l} 5 & 13915 \\ \hline 11 & 2783 \\ \hline 11 & 253 \\ \hline 23 & 23 \\ \hline & 1 \end{array}$$

$$\therefore 13915 = 5 \times 11 \times 11 \times 23 = 5 \times 11^2 \times 23$$

Ex 2D Solutions

Find the H.C.F. of the numbers in each of the following, using the prime factorization method :

Question 1.

Solution:

We have

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$$\begin{array}{r|l} 2 & 84 \\ \hline 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 98 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$84 = 2 \times 2 \times 3 \times 7$$

$$= 2^2 \times 3 \times 7$$

$$98 = 2 \times 7 \times 7 = 2 \times 7^2$$

$$\therefore \text{H.C.F.} = 2 \times 7 = 14.$$

Question 2.

Solution:

We have

$$\begin{array}{r|l} 2 & 170 \\ \hline 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 238 \\ \hline 7 & 119 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\text{So, } 170 = 2 \times 5 \times 17$$

$$238 = 2 \times 7 \times 17$$

$$\therefore \text{H.C.F. of } 170 \text{ and } 238 = 2 \times 17 = 34$$

Question 3.

Solution:

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We have

$\begin{array}{r l} 2 & 504 \\ 2 & 252 \\ 2 & 126 \\ 3 & 63 \\ 3 & 21 \\ 7 & 7 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 980 \\ 2 & 490 \\ 5 & 245 \\ 7 & 49 \\ 7 & 7 \\ \hline & 1 \end{array}$
---	---

So, $504 = 2 \times 2 \times 2 \times 3 \times 3 \times 7 = 2^3 \times 3^2 \times 7$

$980 = 2 \times 2 \times 5 \times 7 \times 7 = 2^2 \times 5 \times 7^2$

$\therefore \text{H.C.F. of } 504 \text{ and } 980 = 2^2 \times 7$

$= 4 \times 7 = 28.$

Question 4.

Solution:

We have

$\begin{array}{r l} 2 & 72 \\ 2 & 36 \\ 2 & 18 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 108 \\ 2 & 54 \\ 3 & 27 \\ 3 & 9 \\ 3 & 3 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 180 \\ 2 & 90 \\ 3 & 45 \\ 3 & 15 \\ 5 & 5 \\ \hline & 1 \end{array}$
---	--	---

So, $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$

$108 = 2 \times 2 \times 3 \times 3 \times 3 = 2^2 \times 3^3$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$180 = 2 \times 2 \times 3 \times 3 \times 5 = 2^2 \times 3^2 \times 5$$

$\therefore$ H.C.F. of 72, 108,

$$180 = 2^2 \times 3^2$$

$$= 4 \times 9 = 36$$

Question 5.

Solution:

We have

$\begin{array}{r l} 2 & 84 \\ 2 & 42 \\ 3 & 21 \\ 7 & 7 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 120 \\ 2 & 60 \\ 2 & 30 \\ 3 & 15 \\ 5 & 5 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 2 & 138 \\ 3 & 69 \\ 23 & 23 \\ \hline & 1 \end{array}$
--	---	---

$$84 = 2 \times 2 \times 3 \times 7 = 2^2 \times 3 \times 7$$

$$120 = 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3 \times 5$$

$$138 = 2 \times 3 \times 23$$

$\therefore$ H.C.F. of 84, 120 and 138 = $2 \times 3 = 6$

Question 6.

Solution:

We have

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$$\begin{array}{r|l} 2 & 106 \\ \hline 53 & 53 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 159 \\ \hline 53 & 53 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 7 & 371 \\ \hline 53 & 53 \\ \hline & 1 \end{array}$$

$$106 = 2 \times 53$$

$$159 = 3 \times 53$$

$$371 = 7 \times 53$$

$$\therefore \text{H.C.F. of } 106, 159, 371 = 53$$

Question 7.**Solution:**

We have

$$272 = 2 \times 2 \times 2 \times 2 \times 17 = 2^4 \times 17$$

$$425 = 5 \times 5 \times 17$$

$$= 5^2 \times 17$$

$$\therefore \text{H.C.F. of } 272 \text{ and } 425 = 17.$$

Question 8.**Solution:**

We have

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$$\begin{array}{r|l}
 2 & 144 \\
 \hline
 2 & 72 \\
 \hline
 2 & 36 \\
 \hline
 2 & 18 \\
 \hline
 3 & 9 \\
 \hline
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 252 \\
 \hline
 2 & 126 \\
 \hline
 3 & 63 \\
 \hline
 3 & 21 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 630 \\
 \hline
 3 & 315 \\
 \hline
 3 & 105 \\
 \hline
 5 & 35 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

So, $144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3 = 2^4 \times 3^2$

$252 = 2 \times 2 \times 3 \times 3 \times 7 = 2^2 \times 3^2 \times 7$

$630 = 2 \times 3 \times 3 \times 5 \times 7 = 2 \times 3^2 \times 5 \times 7$

$\therefore \text{H.C.F. of } 144, 252 \text{ and } 630 = 2 \times 3^2$

$= 2 \times 9 = 18.$

Question 9.

Solution:

We have

$$\begin{array}{r|l}
 3 & 1197 \\
 \hline
 3 & 399 \\
 \hline
 7 & 133 \\
 \hline
 19 & 19 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 5320 \\
 \hline
 2 & 2660 \\
 \hline
 2 & 1330 \\
 \hline
 5 & 665 \\
 \hline
 7 & 133 \\
 \hline
 19 & 19 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 7 & 4389 \\
 \hline
 3 & 627 \\
 \hline
 11 & 209 \\
 \hline
 19 & 19 \\
 \hline
 & 1
 \end{array}$$

So, $1197 = 3 \times 3 \times 7 \times 19 = 3^2 \times 7 \times 19$

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$$5320 = 2 \times 2 \times 2 \times 5 \times 7 \times 19 = 2^3 \times 5 \times 7 \times 19$$

$$4389 = 7 \times 3 \times 11 \times 19$$

$\therefore$ H.C.F. of 1197, 5320,

$$4389 = 7 \times 19 = 133.$$

Find the H.C.F. of the numbers in each of the following using division method:

Question 10.

Solution:

By division method, we have :

$$\begin{array}{r} 58 \overline{) 70} (1 \\ \underline{58} \\ 12 \overline{) 58} (4 \\ \underline{48} \\ 10 \overline{) 12} (1 \\ \underline{10} \\ 2 \overline{) 10} (5 \\ \underline{10} \\ \hline \end{array}$$

$\therefore$ H.C.F. of 58 and 70 = 2.

Question 11.

Solution:

By division method, we have

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$$\begin{array}{r}
 399 \overline{) 437} (1 \\
 \underline{399} \\
 38 \overline{) 399} (10 \\
 \underline{38} \\
 19 \overline{) 38} (2 \\
 \underline{38} \\
 \hline
 \end{array}$$

$\therefore$ H.C.F. of 399 and 437 = 19

Question 12.

Solution:

By division method, we have

$$\begin{array}{r}
 1045 \overline{) 1520} (1 \\
 \underline{1045} \\
 475 \overline{) 1045} (2 \\
 \underline{950} \\
 95 \overline{) 475} (5 \\
 \underline{475} \\
 \hline
 \end{array}$$

$\therefore$ H.C.F. of 1045 and 1520 = 95.

Question 13.

Solution:

By division method, we have

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$$\begin{array}{r}
 1965 \overline{) 2096} \text{ (1} \\
 \underline{1965} \\
 131 \overline{) 1965} \text{ (15} \\
 \underline{131} \\
 655 \\
 \underline{655} \\
 \text{x}
 \end{array}$$

$\therefore$ H.C.F. of 1965 and 2096 = 131

Question 14.

Solution:

By division method, we have

$\therefore$ H.C.F. of 2241 and 2324 = 83.

Question 15.

Solution:

First, we find the H.C.F. of 658 and 940

$$\begin{array}{r}
 658 \overline{) 940} \text{ (1} \\
 \underline{658} \\
 282 \overline{) 658} \text{ (2} \\
 \underline{564} \\
 94 \overline{) 282} \text{ (3} \\
 \underline{282} \\
 \text{x}
 \end{array}$$

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∴ H.C.F. of 658 and 940 is 94.

Now, we find the H.C.F. of 94 and 1128.

$$\begin{array}{r} 94 \overline{) 1128} \quad (12 \\ \underline{94} \\ 188 \\ \underline{188} \\ \text{---} \end{array}$$

∴ H.C.F. of 94 and 1128 = 94

Hence, H.C.F. of 658, 940 and 1128 = 94.

Question 16.

Solution:

First, we find the H.C.F. of 754 and 1508

$$\begin{array}{r} 754 \overline{) 1508} \quad (2 \\ \underline{1508} \\ \text{---} \end{array}$$

∴ H.C.F. of 754 and 1508 is 754

Now, we find the H.C.F. of 754 and 1972

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$$\begin{array}{r}
 754 \overline{) 1972} \quad (2 \\
 \underline{1508} \\
 464 \overline{) 754} \quad (1 \\
 \underline{464} \\
 290 \overline{) 464} \quad (1 \\
 \underline{290} \\
 174 \overline{) 290} \quad (1 \\
 \underline{174} \\
 116 \overline{) 174} \quad (1 \\
 \underline{116} \\
 58 \overline{) 116} \quad (2 \\
 \underline{116} \\
 \hline
 \times
 \end{array}$$

$\therefore$ H.C.F. of 754 and 1972 = 58

Hence, the H.C.F. of 754, 1508 and 1972 = 58.

Question 17.

Solution:

First, we find the H.C.F. of 391 and 425

$$\begin{array}{r}
 391 \overline{) 425} \quad (1 \\
 \underline{391} \\
 34 \overline{) 391} \quad (11 \\
 \underline{34} \\
 51 \\
 34 \\
 \underline{17} \overline{) 34} \quad (2 \\
 \underline{34} \\
 \hline
 \times
 \end{array}$$

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∴ H.C.F. of 391 and 425 is 17.

Now, we find the H.C.F. of 17 and 527

$$\begin{array}{r} 17 \overline{) 527} \quad (31 \\ \underline{51} \\ 17 \\ \underline{17} \\ \hline \times \end{array}$$

∴ H.C.F. of 17 and 527 is 17 Hence, H.C.F. of 391, 425 and 527 = 17.

Question 18.

Solution:

First, we find the H.C.F. of 1794 and 2346

$$\begin{array}{r} 1794 \overline{) 2346} \quad (1 \\ \underline{1794} \\ 552 \overline{) 1794} \quad (3 \\ \underline{1656} \\ 138 \overline{) 552} \quad (4 \\ \underline{552} \\ \hline \times \end{array}$$

H.C.F. of 1794 and 2346 is 138.

Now, we find the H.C.F. of 138 and 4761

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$$\begin{array}{r}
 138 \overline{) 4761} \quad (34 \\
 \underline{414} \\
 621 \\
 \underline{522} \\
 99 \\
 \underline{69} \overline{) 138} \quad (2 \\
 \underline{138} \\
 \hline
 \end{array}$$

∴ H.C.F. of 138 and 4761 is 69.

Hence, the H.C.F. of 1794, 2346 and 4761 = 69.

Show that the following pairs are co-primes :

Question 19.

Solution:

First, we find the H.C.F. of 59, 97.

$$\begin{array}{r}
 59 \overline{) 97} \quad (1 \\
 \underline{59} \\
 38 \\
 \underline{38} \\
 0 \\
 38 \overline{) 59} \quad (1 \\
 \underline{38} \\
 21 \\
 \underline{21} \\
 0 \\
 21 \overline{) 38} \quad (1 \\
 \underline{21} \\
 17 \\
 \underline{17} \\
 0 \\
 17 \overline{) 21} \quad (1 \\
 \underline{17} \\
 4 \\
 \underline{4} \overline{) 17} \quad (4 \\
 \underline{16} \\
 1 \\
 \underline{1} \overline{) 4} \quad (4 \\
 \underline{4} \\
 \hline
 \end{array}$$

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

∴ H.C.F. of 59 and 97 is 1.

Hence 59 and 97 are co-prime.

Question 20.

Solution:

First, we find the H.C.F. of 161 and 192.

$$\begin{array}{r} 161 \overline{) 192} \quad (1 \\ \underline{161} \\ 31 \overline{) 161} \quad (5 \\ \underline{155} \\ 6 \overline{) 31} \quad (5 \\ \underline{30} \\ 1 \overline{) 6} \quad (6 \\ \underline{6} \\ \hline \end{array}$$

∴ H.C.F. of 161 and 192 is 1.

Hence 161 and 192 are co-prime.

Question 21.

Solution:

First, we find the H.C.F. of 343 and 432

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$$\begin{array}{r}
 343 \overline{) 432} (1 \\
 \underline{343} \\
 89 \overline{) 343} (3 \\
 \underline{267} \\
 76 \overline{) 89} (1 \\
 \underline{76} \\
 13 \overline{) 76} (5 \\
 \underline{65} \\
 11 \overline{) 13} (1 \\
 \underline{11} \\
 2 \overline{) 11} (5 \\
 \underline{10} \\
 1 \overline{) 2} (2 \\
 \underline{2} \\
 \hline
 \end{array}$$

∴ H.C.F. of 343 and 432 is 1.

Hence 343 and 432 are co-prime.

Question 22.

Solution:

First, we find the H.C.F. of 512 and 945.

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r}
 512 \overline{) 945} (1 \\
 \underline{512} \\
 433 \overline{) 512} (1 \\
 \underline{433} \\
 79 \overline{) 433} (5 \\
 \underline{395} \\
 38 \overline{) 79} (2 \\
 \underline{76} \\
 3 \overline{) 38} (12 \\
 \underline{3} \\
 08 \\
 6 \\
 2 \overline{) 3} (1 \\
 \underline{2} \\
 1 \overline{) 2} (2 \\
 \underline{2} \\
 \underline{\times}
 \end{array}$$

∴ H.C.F. of 512 and 945 is 1.

Hence 512 and 945 are co-prime.

Question 23.

Solution:

First, we find the H.C.F. of 385 and 621

<https://www.indcareer.com/schools/rs-aggarwal-solutions-for-class-6-maths-chapter-2-factors-and-multiples/>

$$\begin{array}{r}
 385 \overline{) 621} (1 \\
 \underline{385} \\
 236 \overline{) 385} (1 \\
 \underline{236} \\
 149 \overline{) 236} (1 \\
 \underline{149} \\
 87 \overline{) 149} (1 \\
 \underline{87} \\
 62 \overline{) 87} (1 \\
 \underline{62} \\
 25 \overline{) 62} (2 \\
 \underline{50} \\
 12 \overline{) 25} (2 \\
 \underline{24} \\
 1 \overline{) 12} (12 \\
 \underline{12} \\
 \hline
 \times
 \end{array}$$

∴ H.C.F. of 385 and 621 is 1.

Hence the numbers 385 and 621 are co-prime

Question 24.

Solution:

First, we find the H.C.F. of 847 and 1014.

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$$\begin{array}{r}
 847 \overline{)1014} (1 \\
 \underline{847} \\
 167 \overline{)847} (5 \\
 \underline{835} \\
 12 \overline{)167} (13 \\
 \underline{12} \\
 47 \\
 36 \\
 11 \overline{)12} (1 \\
 \underline{11} \\
 1 \overline{)11} (11 \\
 \underline{11} \\
 \hline
 \end{array}$$

$\therefore$ H.C.F. of 847 and 1014 is 1.

Hence 847 and 1014 are co-prime.

Question 25.

Solution:

Clearly, we have to find the greatest number which divides $(615 - 6)$ and $(963 - 6)$ exactly.

So, the required number = H.C.F. of $615 - 6 = 609$ and $963 - 6 = 957$

$$\begin{array}{r}
 609 \overline{) 957} \begin{array}{l} 1 \\ 609 \\ \hline \end{array} \\
 \quad 348 \overline{) 609} \begin{array}{l} 1 \\ 348 \\ \hline \end{array} \\
 \qquad 261 \overline{) 348} \begin{array}{l} 1 \\ 261 \\ \hline \end{array} \\
 \qquad \quad 87 \overline{) 261} \begin{array}{l} 3 \\ 261 \\ \hline \end{array} \\
 \qquad \qquad \quad \times \\
 \qquad \qquad \quad \hline
 \end{array}$$

The required greatest number = 87.

Question 26.

Solution:

Clearly, we have to find the greatest number which divides $2011 - 9 = 2002$ and $2623 - 5 = 2618$.

So, the required greatest number = H.C.F. of 2002 and 2618

$$\begin{array}{r}
 2002 \overline{) 2618} \begin{array}{l} 1 \\ 2002 \\ \hline \end{array} \\
 \quad 616 \overline{) 2002} \begin{array}{l} 3 \\ 1848 \\ \hline \end{array} \\
 \qquad 154 \overline{) 616} \begin{array}{l} 4 \\ 616 \\ \hline \end{array} \\
 \qquad \quad \times \\
 \qquad \quad \hline
 \end{array}$$

∴ Required greatest number = 154.

Question 27.

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Solution:

Clearly, we have to find the greatest number which divides $(445 - 4)$, $(572 - 5)$ and $(699 - 6)$. So, the required number = H.C.F. of 441, 567 and 693. First we find the H.C.F. of 441 and 567

$$\begin{array}{r} 441 \overline{) 567} \quad 1 \\ \underline{441} \\ 126 \overline{) 567} \quad 4 \\ \underline{504} \\ 63 \overline{) 126} \quad 2 \\ \underline{126} \\ \hline \end{array}$$

$\therefore$ H.C.F. of 441 and 567 is 63

$$\begin{array}{r} \text{Also, } 63 \overline{) 693} \quad 11 \\ \underline{63} \\ 63 \\ \underline{63} \\ \hline \end{array}$$

So H.C.F. of 63 and 693 is 63

Hence the required number = 63.

Question 28.**Solution:**

(i) The given fraction = $\frac{161}{207}$

First we find the H.C.F. of 161 and 207

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$$\begin{array}{r}
 161 \overline{) 207} \begin{array}{l} 1 \\ 161 \\ \hline 46 \end{array} \overline{) 161} \begin{array}{l} 3 \\ 138 \\ \hline 23 \end{array} \overline{) 46} \begin{array}{l} 2 \\ 46 \\ \hline \times \end{array}
 \end{array}$$

$\therefore$ H.C.F. of 161 and 207 = 23

Dividing the numerator and the denominator of the given fraction by 23, we get :

$$\frac{161}{207} = \frac{161 \div 23}{207 \div 23} = \frac{7}{9}$$

(ii) The given fraction = $\frac{517}{799}$

First we find the H.C.F. of 517 and 799 as under :

$$\begin{array}{r} 517 \overline{) 799} (1 \\ \underline{517} \\ 282 \overline{) 517} (1 \\ \underline{282} \\ 235 \overline{) 282} (1 \\ \underline{235} \\ 47 \overline{) 235} (5 \\ \underline{235} \\ \hline \end{array}$$

$\therefore$ H.C.F. of 517 and 799 is 47.

Dividing the numerator and the denominator of the given fraction by 47, we get :

$$\frac{517}{799} = \frac{517 \div 47}{799 \div 47} = \frac{11}{17}$$

(iii) The given fraction = $\frac{296}{481}$

First we find the H.C.F. of 296 and 481 as under :

$$\begin{array}{r}
 296 \overline{) 481} (1 \\
 \underline{296} \\
 185 \\
 185 \overline{) 296} (1 \\
 \underline{185} \\
 111 \\
 111 \overline{) 185} (1 \\
 \underline{111} \\
 74 \\
 74 \overline{) 111} (1 \\
 \underline{74} \\
 37 \\
 37 \overline{) 74} (2 \\
 \underline{74} \\
 \underline{\times}
 \end{array}$$

$\therefore$ H.C.F. of 296 and 481 is 37.

Dividing the numerator and denominator of the given fraction by 37, we get

$$\frac{296}{481} = \frac{296 \div 37}{481 \div 37} = \frac{8}{13}$$

Question 29.

Solution:

Lengths of three pieces of timber = 42 metres, 49 metres, 63 metres
 Greatest possible length of each plank = H.C.F. of 42 metres, 49 metres and 63 metres

First we find the H.C.F. of 42 and 49

$$\begin{array}{r}
 42 \overline{) 49} (1 \\
 \underline{42} \\
 7 \\
 7 \overline{) 42} (6 \\
 \underline{42} \\
 \underline{\times}
 \end{array}$$

$\therefore$ H.C.F. of 42 and 49 = 7

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Now we find the H.C.F. of 7 and 63

$$\begin{array}{r} 7 \overline{) 63} \quad 9 \\ \underline{63} \\ 0 \end{array}$$

So, the H.C.F. of 7 and 63 is 7

$\therefore$ H.C.F. of 42 metres, 49 metres of 63 metres = 7 metres

Hence required possible length of each plank = 7 metres.

Question 30.

Solution:

Quantity of milk in three different containers = 403 L, 434 L and 465 L Clearly, the maximum capacity of the required container = H.C.F. of 403 L, 434 L, 465 L, we have

$$\begin{array}{r|rr} 13 & 403 & \\ \hline 31 & 31 & \\ \hline & 1 & \end{array} \quad \begin{array}{r|rr} 2 & 434 & \\ \hline 7 & 217 & \\ \hline 31 & 31 & \\ \hline & 1 & \end{array} \quad \begin{array}{r|rr} 5 & 465 & \\ \hline 3 & 93 & \\ \hline 31 & 31 & \\ \hline & 1 & \end{array}$$

$$\therefore 403 = 13 \times 31$$

$$434 = 2 \times 7 \times 31$$

$$465 = 5 \times 3 \times 31$$

So the H.C.F. of 403 L, 434 L and 465 L = 31 L

Maximum capacity of the required container = 31 L.

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Question 31.

Solution:

The given fruits = 527 apples, 646 pears and 748 oranges

Clearly, the greatest number of fruits in each heap = H.C.F. of 527, 646 and 748 we have

$$\begin{array}{r|l}
 2 & 50 - 60 - 75 - 100 \\
 \hline
 2 & 25 - 30 - 75 - 50 \\
 \hline
 3 & 25 - 15 - 75 - 25 \\
 \hline
 5 & 25 - 5 - 25 - 25 \\
 \hline
 5 & 5 - 1 - 5 - 5 \\
 \hline
 & 1 - 1 - 1 - 1
 \end{array}$$

$$\therefore 527 = 17 \times 31$$

$$646 = 2 \times 17 \times 19$$

$$748 = 2 \times 2 \times 11 \times 17$$

So, the H.C.F. of 527, 646 and 748 = 17

$\therefore$ Required number of fruits in each heap = 17

$$\text{Total number of fruits} = 527 + 646 + 748 = 1921$$

Number of heaps = $\frac{\text{Total number of fruits}}{\text{Number of fruits in one heap}}$

$$= \frac{1921}{17}$$

$$= 113$$

Question 32.

Solution:

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The given lengths are :

$$7 \text{ metres} = 7 \times 100 \text{ cm}$$

$$= 700 \text{ cm}$$

$$3 \text{ metres } 85 \text{ cm} = (3 \times 100 + 85) \text{ cm}$$

$$= 385 \text{ cm}$$

$$12 \text{ metres } 95 \text{ cm} = (12 \times 100 + 95) \text{ cm}$$

$$= 1295 \text{ cm}$$

Clearly, the length of the required longest tape = H.C.F. of 700 cm, 385 cm and 1295 cm

We have

$\begin{array}{r l} 2 & 700 \\ \hline 2 & 350 \\ \hline 5 & 175 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 5 & 385 \\ \hline 7 & 77 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$	$\begin{array}{r l} 5 & 1295 \\ \hline 7 & 259 \\ \hline 37 & 37 \\ \hline & 1 \end{array}$
---	---	---

$$\text{So, } 700 = 2 \times 2 \times 5 \times 5 \times 7$$

$$= 2^2 \times 5^2 \times 7$$

$$385 = 5 \times 7 \times 11$$

$$1295 = 5 \times 7 \times 37$$

$$\therefore \text{H.C.F. of } 700, 385 \text{ and } 1295 = 5 \times 7 = 35$$

$\therefore$ The required length of the longest tape

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= 35 cm.

Question 33.

Solution:

Length of the courtyard = 18 m 72 cm = $(18 \times 100 + 72)$ cm = 1872 cm

Breadth of the courtyard = 13 m 20 cm = $(13 \times 100 + 20)$ cm = 1320 cm

Greatest side of each of the square tiles = H.C.F. of 1872 cm and 1320 cm

Now

$$\begin{array}{r|l} 2 & 1872 \\ \hline 2 & 936 \\ \hline 2 & 468 \\ \hline 2 & 234 \\ \hline 9 & 117 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 1320 \\ \hline 2 & 660 \\ \hline 2 & 330 \\ \hline 3 & 165 \\ \hline 5 & 55 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$1872 = 2 \times 2 \times 2 \times 2 \times 9 \times 13$$

$$= 2^4 \times 3^2 \times 13$$

$$1320 = 2 \times 2 \times 2 \times 3 \times 5 \times 11$$

$$= 2^3 \times 3 \times 5 \times 11$$

So, the H.C.F. of 1872 and 1320

$$= 2^3 \times 3 = 8 \times 3 = 24$$

Greatest side of the square tile = 24 cm

Now Area of the courtyard = Length x Breadth = $1872 \times 1320 \text{ cm}^2$

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Area of one square tile = Side x Side

$$= 24 \times 24 \text{ cm}^2$$

∴ Least possible number of such tiles

$$= \frac{\text{Area of the courtyard}}{\text{Area of the tile}}$$

$$= \frac{1872 \times 13}{24 \times 24}$$

$$= 78 \times 55$$

$$= 4290$$

Question 34.

Solution:

Let the two prime numbers be 13 and 17, we find the H.C.F. of 13 and 17 as under

$$\begin{array}{r}
 13 \overline{) 17} (1 \\
 \underline{13} \\
 4 \overline{) 13} (3 \\
 \underline{12} \\
 1 \overline{) 4} (4 \\
 \underline{4} \\
 \times
 \end{array}$$

$\therefore$ H.C.F. of two prime numbers 13 and 17 = 1.

- (ii) Let the two consecutive numbers be 59 and 60. We find the H.C.F. of 59 and 60 as under :

$$\begin{array}{r}
 59 \overline{) 60} (1 \\
 \underline{59} \\
 1 \overline{) 59} (59 \\
 \underline{5} \\
 09 \\
 \underline{9} \\
 \times
 \end{array}$$

∴ H.C.F. of two consecutive numbers
59 and 60 = 1.

(iii) Let the two co-primes be 45 and 56. We
find the H.C.F. of 45 and 56 as under :

$$\begin{array}{r}
 45 \overline{) 56} (1 \\
 \underline{45} \\
 11 \overline{) 45} (4 \\
 \underline{44} \\
 1 \overline{) 11} (11 \\
 \underline{11} \\
 \times
 \end{array}$$

∴ H.C.F. of two co-primes 45 and 56
= 1.

(iv) We take 2 and another even number = 48
and find the H.C.F. of 2 and 48 as under :

$$\begin{array}{r}
 2 \overline{) 48} (24 \\
 \underline{4} \\
 08 \\
 \underline{8} \\
 \times
 \end{array}$$

∴ H.C.F. of 2 and an even number 48 = 2.

Ex 2E Solutions

Find the L.C.M. of the numbers given below:

Question 1.

Solution:

We have

$$42 = 2 \times 3 \times 7$$

$$63 = 3 \times 3 \times 7$$

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$$= 3^2 \times 7$$

$$\therefore \text{L.C.M. of 42 and 63} = 2 \times 3^2 \times 7$$

$$= 2 \times 9 \times 7$$

$$= 18 \times 7$$

$$= 126$$

Question 2.**Solution:**

We have

$$\begin{array}{r|l} 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\text{So, } 60 = 2 \times 2 \times 3 \times 5$$

$$= 2^2 \times 3 \times 5$$

$$75 = 3 \times 5 \times 5 = 3 \times 5^2$$

$$\therefore \text{L.C.M. of 60 and 75} = 2^2 \times 3 \times 5^2$$

$$= 4 \times 3 \times 25$$

$$= 4 \times 75 = 300$$

Question 3.**Solution:**

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We have

$$\begin{array}{r|l} 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

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

$$\begin{array}{r|l} 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\text{So, } 12 = 2 \times 2 \times 3 = 2^2 \times 3$$

$$18 = 2 \times 3 \times 3 = 2 \times 3^2$$

$$20 = 2 \times 2 \times 5 = 2^2 \times 5$$

$$\therefore \text{L.C.M. of } 12, 18 \text{ and } 20 = 2^2 \times 3^2 \times 5$$

$$= 4 \times 9 \times 5$$

$$= 20 \times 9$$

$$= 180$$

Question 4.

Solution:

We have

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

$$\begin{array}{r|l} 2 & 60 \\ \hline 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 72 \\ \hline 2 & 36 \\ \hline 2 & 18 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

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$$36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$$

$$60 = 2 \times 2 \times 3 \times 5 = 2^2 \times 3 \times 5$$

$$72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$$

$$\therefore \text{L.C.M. of } 36, 60 \text{ and } 72 = 2^3 \times 3^2 \times 5$$

$$= 8 \times 9 \times 5$$

$$= 40 \times 9$$

$$= 360$$

Question 5.**Solution:**

We have

$$36 = 2 \times 2 \times 3 \times 3 = 2^2 \times 3^2$$

$$40 = 2 \times 2 \times 2 \times 5 = 2^3 \times 5$$

$$126 = 2 \times 3 \times 3 \times 7 = 2 \times 3^2 \times 7$$

$$\therefore \text{L.C.M. of } 36, 40 \text{ and } 126 .$$

$$= 2^3 \times 3^2 \times 5 \times 7$$

$$= 8 \times 9 \times 5 \times 7$$

$$= 72 \times 35$$

$$= 2520$$

Question 6.**Solution:**

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$$\begin{array}{r|l}
 2 & 16 - 28 - 40 - 77 \\
 \hline
 2 & 8 - 14 - 20 - 77 \\
 \hline
 2 & 4 - 7 - 10 - 77 \\
 \hline
 7 & 2 - 7 - 5 - 77 \\
 \hline
 & 2 - 1 - 5 - 11
 \end{array}$$

∴ L.C.M. of given numbers

$$= 2 \times 2 \times 2 \times 7 \times 2 \times 5 \times 11$$

$$= 8 \times 14 \times 55$$

$$= 112 \times 55 = 6160$$

Question 7.

Solution:

$$\begin{array}{r|l}
 2 & 28 - 36 - 45 - 60 \\
 \hline
 2 & 14 - 18 - 45 - 30 \\
 \hline
 3 & 7 - 9 - 45 - 15 \\
 \hline
 3 & 7 - 3 - 15 - 5 \\
 \hline
 5 & 7 - 1 - 5 - 5 \\
 \hline
 & 7 - 1 - 1 - 1
 \end{array}$$

∴ L.C.M. of given numbers = $2 \times 2 \times 3 \times 3 \times 5 \times 7$

$$= 36 \times 35$$

$$= 1260$$

Question 8.

Solution:

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2	144	–	180	–	384
2	72	–	90	–	192
2	36	–	45	–	96
2	18	–	45	–	48
3	9	–	45	–	24
3	3	–	15	–	8
	1	–	5	–	8

∴ L.C.M. of given numbers

$$= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 8$$

$$= 16 \times 9 \times 40$$

$$= 144 \times 40$$

$$= 5760$$

Question 9.

Solution:

∴ L.C.M. of given numbers = $2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 2 \times 3$

$$= 32 \times 54$$

$$= 1728$$

Find the H.C.F. and L.C.M. of :

Question 10.

Solution:

First we find the H.C.F. of the given numbers as under :

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$$\begin{array}{r}
 117 \overline{) 221} (1 \\
 \underline{117} \\
 104 \overline{) 117} (1 \\
 \underline{104} \\
 13 \overline{) 104} (8 \\
 \underline{104} \\
 \hline
 \times
 \end{array}$$

$\therefore$ H.C.F. of 117 and 221 = 13

Now L.C.M. = product of numbers their H.C.F

$$= 117 \times 221 / 13$$

$$= 9 \times 221 = 1989$$

$\therefore$ H.C.F. = 13 and L.C.M. = 1989

Question 11.

Solution:

First we find the H.C.F. of 234 and 572 as under :

$$\begin{array}{r}
 234 \overline{) 572} (2 \\
 \underline{468} \\
 104 \overline{) 234} (2 \\
 \underline{208} \\
 26 \overline{) 104} (4 \\
 \underline{104} \\
 \hline
 \times
 \end{array}$$

H.C.F. of 234 and 572 = 26

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Now L.C.M. = product of numbers their H.C.F

$$= 234 \times 57226$$

$$= 9 \times 572$$

$$= 5148$$

Question 12.

Solution:

First we find the H.C.F. of 693 and 1078 as under :

H.C.F. of 693 and 1078 = 77 Product of numbers

Now L.C.M. = product of numbers their H.C.F

$$= 693 \times 107877$$

$$= 9 \times 1078$$

$$= 9702$$

H.C.F. = 77 and L.C.M. = 9702

Question 13.

Solution:

First we find the H.C.F. of 145 and 232 as under :

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$$\begin{array}{r}
 145 \overline{) 232} (1 \\
 \underline{145} \\
 87 \overline{) 145} (1 \\
 \underline{87} \\
 58 \overline{) 87} (1 \\
 \underline{58} \\
 29 \overline{) 58} (2 \\
 \underline{58} \\
 \times
 \end{array}$$

H.C.F. of 145 and 232 = 29

Now L.C.M. = product of numbers their H.C.F

$$= 145 \times 232 \div 29$$

$$= 5 \times 232 = 1160$$

H.C.F. = 29 and L.C.M. = 1160

Question 14.

Solution:

First we find the H.C.F. of 861 and 1353 as under :

H.C.F. of 861 and 1353 = 123

Now L.C.M. = product of numbers their H.C.F

$$= 861 \times 1353 \div 123$$

$$= 7 \times 1353 = 9471$$

H.C.F. = 123 and L.C.M. = 9471

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Question 15.**Solution:**

First we find the H.C.F. of 2923 and 3239 as under :

$$\begin{array}{r} 2923 \overline{) 3239} \quad (1 \\ \underline{2923} \\ 316 \end{array} \begin{array}{r} 2923 \overline{) 316} \quad (9 \\ \underline{2844} \\ 79 \end{array} \begin{array}{r} 316 \overline{) 79} \quad (4 \\ \underline{316} \\ \times \end{array}$$

H.C.F. of 2923 and 3239 = 79

Now L.C.M. = product of numbers ÷ their H.C.F

$$= 2923 \times 3239 \div 79$$

$$= 37 \times 3239 = 119843$$

H.C.F. = 79 and L.C.M. = 119843

Question 16.**Solution:**

We have

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$$\begin{array}{r|l} 3 & 87 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 5 & 145 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$$

So, $87 = 3 \times 29$

$145 = 5 \times 29$

$\therefore$ H.C.F. of 87 and 145 = 29

L.C.M. of 87 and 145 = $3 \times 5 \times 29$
 $= 15 \times 29 = 435$

Now product of 87 and 145 = 87×145
 $= 12615$

Their H.C.F. $\times$ L.C.M. = 29×435
 $= 12615$

Hence verified.

(ii) We have

$$\begin{array}{r|l} 2 & 186 \\ \hline 3 & 93 \\ \hline 31 & 31 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 13 & 403 \\ \hline 31 & 31 \\ \hline & 1 \end{array}$$

$$\text{So, } 186 = 2 \times 3 \times 31$$

$$403 = 13 \times 31$$

$$\therefore \text{H.C.F. of } 186 \text{ and } 403 = 31$$

$$\text{L.C.M. of } 186 \text{ and } 403$$

$$= 2 \times 3 \times 13 \times 31 = 2418$$

$$\text{Now product of } 186 \text{ and } 403$$

$$= 186 \times 403 = 74958$$

$$\text{Their H.C.F.} \times \text{L.C.M.} = 31 \times 2418$$

$$= 74958$$

Hence verified.

(iii) 490, 1155

We have

$\begin{array}{r} 2 \overline{)490} \\ 5 \overline{)245} \\ 7 \overline{)49} \\ 7 \overline{)7} \\ \hline 1 \end{array}$	$\begin{array}{r} 3 \overline{)1155} \\ 5 \overline{)385} \\ 7 \overline{)77} \\ 11 \overline{)11} \\ \hline 1 \end{array}$
--	---

$$\text{So, } 490 = 2 \times 5 \times 7 \times 7 = 2 \times 5 \times 7^2$$

$$1155 = 3 \times 5 \times 7 \times 11$$

$$\therefore \text{H.C.F. of } 490 \text{ and } 1155 = 5 \times 7 = 35$$

$$\text{L.C.M. of } 490 \text{ and } 1155$$

$$= 2 \times 3 \times 5 \times 7^2 \times 11$$

$$= 2 \times 3 \times 5 \times 49 \times 11$$

$$= 30 \times 539 = 16170$$

$$\text{Now, product of } 490 \text{ and } 1155$$

$$= 490 \times 1155 = 565950$$

$$\text{Their H.C.F.} \times \text{L.C.M.} = 35 \times 16170$$

$$= 565950$$

Hence verified.

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Question 17.**Solution:**

We know that

L.C.M = product of the number their H.C.F

$$= 216012$$

$$= 180$$

Question 18.**Solution:**

We know that

L.C.M = product of the number their H.C.F

$$= 2560320$$

$$= 8$$

Question 19.**Solution:**

We know that

One number x The other number

$$= \text{H.C.F.} \times \text{L.C.M.}$$

∴ The other number

$$= \text{H.C.F} \times \text{L.C.M} \div \text{Onenumber}$$

$$= 145 \times 2175725$$

$$= 21755$$

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$$= 435$$

Required number = 435

Question 20.

Solution:

We know that

One number $\times$ The other number

$$= \text{H.C.F.} \times \text{L.C.M.}$$

The other number

$$= \text{H.C.F.} \times \text{L.C.M.} \div \text{One number}$$

$$= 131 \times 8253917$$

$$= 82537$$

Required number = 1179

Question 21.

Solution:

Required least number = L.C.M. of 15, 20, 24, 32 and 36

3	15	20	24	32	36
2	5	20	8	32	12
2	5	10	4	16	6
2	5	5	2	8	3
5	5	5	1	4	3
	1	1	1	4	3

$$\text{L.C.M.} = 3 \times 2 \times 2 \times 2 \times 5 \times 4 \times 3$$

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$$= 24 \times 60$$

$$= 1440$$

Hence, required least number = 1440

Question 22.

Solution:

Clearly, required least number = (L.C.M. of the given numbers + 9)

$$\begin{array}{r|rrrr} 4 & 25 & - & 40 & - & 60 \\ 5 & 25 & - & 10 & - & 15 \\ \hline & 5 & - & 2 & - & 3 \end{array}$$

L.C.M. of the given numbers

$$= 4 \times 5 \times 5 \times 2 \times 3$$

$$= 600$$

Required least number

$$= 600 + 9$$

$$= 609$$

Question 23.

Solution:

First we find the L.C.M. of the given numbers as under :

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2	16	–	18	–	24	–	30
2	8	–	9	–	12	–	15
2	4	–	9	–	6	–	15
3	2	–	9	–	3	–	15
	2	–	3	–	1	–	5

L.C.M of the given numbers = $2 \times 2 \times 2 \times 3 \times 2 \times 3 \times 5$

= $24 \times 30 = 720$

Now least number of five digits = 10000 Dividing 10000 by 720, we get

Clearly if we add 80 to 640, it will become 720 which is exactly divisible by 720.

Required least number of five digits = $10000 + 80 = 10080$

Question 24.

Solution:

The greatest number of five digits exactly divisible by the given numbers = The greatest number of five digits exactly divisible by the L.C.M. of given numbers.

Now

L.C.M. of given numbers

= $2 \times 2 \times 3 \times 3 \times 5 \times 2 = 360$

Now greatest number of five digits = 99999

Dividing 99999 by 360, we get

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$$\begin{array}{r}
 360 \overline{) 99999} \left(277 \right. \\
 \underline{720} \\
 2799 \\
 \underline{2520} \\
 2799 \\
 \underline{2520} \\
 279 \\
 \underline{279} \\
 0
 \end{array}$$

Required greatest number of five digits

$$= 99999 - 279$$

$$= 99720$$

$$\begin{array}{r}
 2 \overline{) 9 - 12 - 15 - 18 - 24} \\
 2 \overline{) 9 - 6 - 15 - 9 - 12} \\
 3 \overline{) 9 - 3 - 15 - 9 - 6} \\
 3 \overline{) 3 - 1 - 5 - 3 - 2} \\
 1 - 1 - 5 - 1 - 2
 \end{array}$$

Question 25.

Solution:

Three bells will again toll together after an interval of time which is exactly divisible by 9, 12, 15 minutes.

Required time = L.C.M. of 9, 12, 15 minutes

$$\begin{array}{r}
 3 \overline{) 9 - 12 - 15} \\
 3 - 4 - 5
 \end{array}$$

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L.C.M. of 9, 12, 15 minutes = $3 \times 3 \times 4 \times 5$ minutes

= 9×20 minutes

= 180 minutes

Required time = 180 minutes

= 18060

= 3 hours

Question 26.

Solution:

Required distance = L.C.M. of 36 cm, 48 cm and 54 cm

$$\begin{array}{r|l} 2 & 36 - 48 - 54 \\ \hline 2 & 18 - 24 - 27 \\ \hline 3 & 9 - 12 - 27 \\ \hline 3 & 3 - 4 - 9 \\ \hline & 1 - 4 - 3 \end{array}$$

L.C.M. of 36 cm, 48 cm. 54 cm

= $2 \times 2 \times 3 \times 3 \times 4 \times 3$ cm

= 36×12 cm

= 432 cm

= 4 m 32 cm

Required distance = 4 m 32 cm

Question 27.

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Solution:

Required time = L.C.M. of 48 seconds, 72 seconds and 108 seconds

$$\begin{array}{r|l}
 2 & 48 - 72 - 108 \\
 \hline
 2 & 24 - 36 - 54 \\
 \hline
 2 & 12 - 18 - 27 \\
 \hline
 3 & 6 - 9 - 27 \\
 \hline
 3 & 2 - 3 - 9 \\
 \hline
 & 2 - 1 - 3
 \end{array}$$

L.C.M. of 48 sec., 72 sec. and 108 sec.

$$= 2 \times 2 \times 2 \times 3 \times 3 \times 2 \times 3 \text{ sec.}$$

$$= 24 \times 18 \text{ sec.}$$

$$= 432 \text{ sec.}$$

Required time = 432 sec.

$$= 43260$$

$$= 7 \text{ m in } 12 \text{ sec}$$

Question 28.

Solution:

Lengths of three rods = 45 cm, 50 cm and 75 cm

Required least length of the rope = L.C.M. of 45 cm, 50 cm, 75 cm

We have

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$$\begin{array}{r|l}
 3 & 45 - 50 - 75 \\
 5 & 15 - 50 - 25 \\
 5 & 3 - 10 - 5 \\
 \hline
 & 3 - 2 - 1
 \end{array}$$

$\therefore$ L.C.M. of 45 cm, 50 cm and 75 cm

$$= 3 \times 5 \times 5 \times 3 \times 2 \text{ cm}$$

$$= 15 \times 30 \text{ cm}$$

$$= 450 \text{ cm}$$

$\therefore$ Required length of the rope = 450 cm

$$= \frac{450}{100} \text{ m}$$

$$= 4.5 \text{ m.}$$

Question 29.

Solution:

The time after which both the devices will beep together = L.C.M. of 15 minutes and 20 minutes

Now,

$$\begin{array}{r|l}
 5 & 15 - 20 \\
 \hline
 & 3 - 4
 \end{array}$$

L.C.M. of 15 minutes and 20 minutes

$$= 5 \times 3 \times 4$$

$$= 60 \text{ minutes}$$

$$= 1 \text{ hour}$$

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Both the devices will beep together after 1 hour from 6 a.m.

Required time = 6 + 1

= 7 a.m.

Question 30.

Solution:

The circumferences of four wheels = 50 cm, 60 cm, 75 cm and 100 cm

Required least distance = L.C.M. of 50 cm, 60 cm, 75 cm and 100 cm Now,

$$\begin{array}{r|rrrr} 2 & 50 & 60 & 75 & 100 \\ \hline 2 & 25 & 30 & 75 & 50 \\ \hline 3 & 25 & 15 & 75 & 25 \\ \hline 5 & 25 & 5 & 25 & 25 \\ \hline 5 & 5 & 1 & 5 & 5 \\ \hline & 1 & 1 & 1 & 1 \end{array}$$

L.C.M. of 50 cm, 60 cm, 75 cm, 100 cm

= $2 \times 2 \times 3 \times 5 \times 5$ cm

= 300 cm = 3 m

Required least distance = 3 m.

Ex 2F Solutions

Objective Questions

Tick the correct answer in each of the following :

Question 1.

Solution:

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(c) Because sum of its digits is $8 + 3 + 4 + 7 + 9 + 5 + 6 + 0 = 42$ which is divisible by 3.

Question 2.

Solution:

(a) Because sum of its digits is $8 + 5 + 7 + 6 + 9 + 0 + 1 = 36$ which is divisible by 9.

Question 3.

Solution:

(d) Because the number formed by tens and ones digits is divisible by 4 i.e. $32 \div 4 = 8$.

Question 4.

Solution:

(b) Because the number formed by hundred, tens and ones digits is divisible by 8 i.e. $176 \div 8 = 22$.

Question 5.

Solution:

(a) Because its one digit is divisible by 2 and sum of its digits is $8 + 7 + 9 + 0 + 4 + 3 + 2 = 33$,

which is divisible by 3. Hence it is divisible by 6.

Question 6.

Solution:

(c) Because the difference of the sums of its odd places digits and of its even places digits is $(2 + 2 + 2 + 2) - (2 + 2 + 2 + 2)$ i.e. $8 - 8 = 0$, which is zero and is divisible by 11.

Question 7.

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Solution:

(d) Because 97 has no factors other than 1 and itself.

Question 8.

Solution:

(c) Because 179 has no factors other than 1 and itself.

Question 9.

Solution:

(c) Because 263 has no factors other than 1 and itself.

Question 10.

Solution:

(a), (b) Because the common factors of 9 and 10 are none but 1.

Question 11.

Solution:

(c) Because 32 has factors which are 2, 2, 2, 2, 2.

Question 12.

Solution:

(d) Because 18 is the highest common factor of 144 and 198.

Question 13.

Solution:

(a) Because 12 is the highest common factors of these numbers 144, 180 and 192.

Question 14.

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Solution:

(b) Because 161 and 192 have no common factor other than 1, i.e., HCF of 161 and 192 is 1.

Question 15.

Solution:

(d) Because HCF of 289 and 391 is 17

and $289 \div 17 = 17$ and $391 \div 17 = 23$

Question 16.

Solution:

(d) Because dividing 134 and 167 by 33 remainder is 2 in each case.

Question 17.

Solution:

(c) Because 360 is the least multiple of 24, 36 and 40.

Question 18.

Solution:

(d) Because 540 is the least multiple of 12, 15, 20 and 27

Question 19.

Solution:

(c) Because $1263 - 3 = 1260$ is divisible by 14, 28, 36 and 45.

Question 20.

Solution:

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(c) Because HCF of two co-prime number is always 1.

Question 21.

Solution:

(c) Because HCF of a and b, two co-primes is 1.

$$\text{LCM} = a \times b = ab.$$

Question 22.

Solution:

(c) Because LCM of two numbers = Product of these number $\div$ their HCF i.e $2160 \div 12 = 180$.

Question 23.

Solution:

(b) Because second number

$$= \text{LCM} \times \text{HCF} \text{ 1st number}$$

$$\text{i.e., } 145 \times 2175725$$

$$= 435$$

Question 24.

Solution:

(c) Because LCM of 15, 20, 24, 32 and 36 = 1440.

Question 25.

Solution:

(d) Because LCM of 9, 12, 15 is 180. 180

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180 minutes = 18060

= 3 hours.



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- Chapter 3–Whole Numbers
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- Chapter 5–Fractions
- Chapter 6–Simplification
- Chapter 7–Decimals
- Chapter 8–Algebraic Expressions
- Chapter 9–Linear Equations in One Variable
- Chapter 10–Ratio, Proportion and Unitary Method
- Chapter 11–Line Segment, Ray and Line
- Chapter 12–Parallel Lines
- Chapter 13–Angles and Their Measurement
- Chapter 14–Constructions (Using Ruler and a Pairs of Compasses)
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- Chapter 20–Two-Dimensional Reflection Symmetry (Linear Symmetry)
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- Chapter 22–Data Handling
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He was born on January 2, 1946 in a village of Delhi. He graduated from Kirori Mal College, University of Delhi. After completing his M.Sc. in Mathematics in 1969, he joined N.A.S. College, Meerut, as a lecturer. In 1976, he was awarded a fellowship for 3 years and joined the University of Delhi for his Ph.D. Thereafter, he was promoted as a reader in N.A.S. College, Meerut. In 1999, he joined M.M.H. College, Ghaziabad, as a reader and took voluntary retirement in 2003. He has authored more than 75 titles ranging from Nursery to M. Sc. He has also written books for competitive examinations right from the clerical grade to the I.A.S. level.

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