Chapter - 1st

Class - 6th

Number System:

Exercise 1C

12. The sum of two numbers is 10750308. If one of them is 8967519. What is the other number?

Sol: Sum of two numbers = 10750308

One number = 8967519

∴ Other number = Sum of two numbers − One number

= 10750308 − 8967519

= 1782789.

2.17. How much money was collected from 1786 students of a school for a charity show if each student contributed ₹625?

Sol: Contribution from each student for a charity show = ₹625

Contribution from 1786 students for a charity show = 1786 × 625

₹2116250

Q.22. The product of two numbers is 13421408. If one of the number is 364. Find the other?

Sol: Product of two numbers = 13421408.

One number = 364

$\therefore$ Other number = $\frac{\text{Product of two numbers}}{\text{One number}}$

$= \frac{13421408}{364}$

$= 36872$.

Q.23 If 36 flats cost ₹ 68251500, what is the cost of each flat?

Sol: Cost of 36 flats = ₹ 68251500

Cost of each flat = ₹ 68251500 ÷ 36

= ₹ 1895875

Estimation:

Exercise 1D

Q.1. Round each of the following numbers to the nearest ten:

c) 3869

Sol: In 3869, the ones digit is $9 > 5$.

$\therefore$ the required rounded number = 3870

Q.2. Round each of the following numbers to the nearest hundred:

a) 814.

Sol: In 814, the tens digit is $1 < 5$

$\therefore$ the required rounded number = 800

d) 98165

Sol: In 98165, the tens digit is $6 > 5$

$\therefore$ the required rounded number = 98200

Q.3. Round each of the following numbers to the nearest thousand:

c) 16719

Sol: In 16719, the hundreds digit is $7 > 5$

$\therefore$ the required rounded number = 17000

Q.4. Round each of the following numbers to the nearest ten thousand:

c) 34890

Sol: In 34890, the thousands digit is 4 < 5.

∴ the required rounded number = 30000

Estimate each sum to the nearest 10:

5. (57 + 34)

Sol: 57 estimated to the nearest 10 = 60

34 estimated to the nearest 10 = 30

Hence, the required estimation = (60 + 30)

= 90

13. (538 + 276)

Sol: 538 estimated to the nearest 10 = 540

276 estimated to the nearest 10 = 280

Hence, the required estimation = (540 + 280)

= 820

Estimate each sum to the nearest thousand

Q.21 (46703 + 11375)

Sol: 46703 estimated to the nearest thousand = 47000

11375 estimated to the nearest thousand = 11000

Hence, the required estimation = (47000 + 11000)

= 58000

Estimate each difference to the nearest hundred.

5. (7258 − 2429)

7258 estimated to the nearest 100 = 7300

2429 estimated to the nearest 100 = 2400

Hence, the required estimation = (7300 − 2400)

= 4900

Estimating the products:

Exercise 1E.

Estimate each of the following products by rounding off each number to the nearest ten:

1. 38 × 63

Sol: 38 estimated to the nearest 10 = 40

63 estimated to the nearest 10 = 60

Hence, the required estimation = $\frac{40 \times 60}{2400}$

5. 64 × 58

Sol: 64 estimated to the nearest 10 = 60

58 estimated to the nearest 10 = 60

Hence, the required estimation = 60 × 60

= 3600

Estimate each of the following products by rounding off each number to the nearest hundred:

11. 392×138

Sol: 392 estimated to the nearest 100 = 400

138 estimated to the nearest 100 = 100

Hence, the required estimation = 400×100

$= 40000$

Estimate each of the following products by rounding off the first number upwards and the second number downwards:

Q.13 183×154

Sol: 183 estimated upwards = 200

154 estimated downwards = 100

Hence the estimated product = 200×100

$= 20000$

Q.17. 680×164.

Sol: 680 estimated upwards = 700

164 estimated downwards = 100

Hence the estimated product = 700×100

$= 70000$

Estimate each of the following products by rounding off the first number downwards and the second number upwards:

Q19. 356×278

Sol: 356 estimated downwards = 300

278 estimated upwards = 300

Hence, the estimated product = 300×300

$= 90000$.

Estimating the quotients:

Exercise 17.

Find the estimated quotient for each of the following:

1. $87 \div 28$

Sol: $87 \div 28$ is approximately equal to $90 \div 30$

$= 3$

$$30 \overline{)90} \; 3$$
$$\underline{90}$$
$$0$$

5. $725 \div 23$

Sol: $725 \div 23$ is approximately equal to $700 \div 20$

$= 35$

$$20 \overline{)700} \; 35$$
$$\underline{60}$$
$$100$$
$$\underline{100}$$
$$0$$

GREEN VALLEY EDUCATIONAL INSTITUT
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Unit - I

Class: 6th

Chapter No. 02

Factors and Multiples

Ex: 2A

Q2: Write down all the factors:
a) 20

Sol: We know that,

$20 = 1 \times 20$

$20 = 2 \times 10$

$20 = 4 \times 5$

$\therefore$, 1, 2, 4, 5, 10, 20 are all factors of 20.

Q3: Write the first five multiples of
a) 17

Sol: The first five multiples of 17 are:

$17 \times 1 = 17$

$17 \times 2 = 34$

$17 \times 3 = 51$

$17 \times 4 = 68$

$17 \times 5 = 85$

Q6: Write all the primes numbers between 10 and 40.

Sol: All the prime numbers between 10 and 40 are:
11, 13, 17, 19, 29, 31, 37

Q14: Express each of the following no.'s as the sum of two odd primes:

a) 36

Sol: $36 = 7 + 29$

Q15: Express each of the following odd no.'s as a sum of three odd primes:

a) 31

Sol: $31 = 5 + 7 + 19$

Q16: Express each of the following no.'s as the sum of twin primes:

a) 36

Sol: $36 = 17 + 19$

Ex: 2A

Q6: Test the divisibility of the following numbers by 7:

a) 826

Sol: Consider the number 826

Double the digit at ones place = $6 \times 2 = 12$

Subtract the answer from the no. without ones digit = $82 - 12$

$= 70$

Since 70 is divisible by 7.

$\therefore$ 826 is divisible by 7.

Verification:

$$7 \overline{)\,826\,} \;118$$

$$\begin{array}{r} 7 \\ \hline 12 \\ 7 \\ \hline 56 \\ 56 \\ \hline \times \end{array}$$

Q10 Test the divisibility of the following no.'s by 11.

a) 4334

Sol: Consider the number $\overset{E}{4}\overset{O}{3}\overset{E}{3}\overset{O}{4}$ (O: odd place, E: Even place)

Sum of its digits in odd places =

$4 + 3 = 7$

Sum of its digits in even places =

$3 + 4 = 7$

Difference of these sums = $(7-7)$

$= 0$

Therefore, 4334 is divisible by 11.

Q11 In each of the following no.'s, replace * by the smallest no. to make it divisible by 3:

a) 27*4

Sol: Since in 27*4, sum of digits =

$2 + 7 + * + 4$

$= 13 + * \quad -(1)$

Put $* = 0$ in eqn (1), we get

$13 + * = 13 + 0 = 13$, which is not divisible by 3.

Put $* = 1$ in eqn (1), we get

$13 + * = 13 + 1 = 14$, which is not divisible by 3

Put $* = 2$ in $=n$ (1), we get

$13 + * = 13 + 2 = 15$, which is divisible by 3.

$\therefore$ 2 is the smallest no. which replace * to make it divisible by 3.

Q13 In each of the following no.'s replace * by the smallest no. to make it divisible by 11:

a) $26*5$

Sol: Consider the number $26*5$

Sum of digits at odd places $= 5+6$
$= 11$

Sum of digits at even places $= *+2$

The no. $26*5$ should be divisible by 11 if the difference of sum of digits at odd and even places is either zero or multiple of 11.

i.e $11 - (*+2) = 0$ or multiple of 11.

$\Rightarrow 11 - * - 2 = 0$ " ,,

$= 9 - *$

Put $* = 9$, we get

$9 - 9 = 0$

$\therefore$ Given no. is divisible by 11 when $* = 9$.

Q15 Which of the following are prime no.'s :

(a) 103

We know that $15 \times 15 > 200$

So, we adopt the following rule:

RULE:

Examine whether the given no. is divisible by any prime no. less than 15. If yes then it is not prime; Otherwise it is prime.

Sol: Test the divisibility of 103 by each one of the prime no.'s 2, 3, 5, 7, 11, 13 taking one by one. We find that 103 is not divisible by none of them.

So, 103 is a prime no.

Prime Factorization

Ex: 2C

Give the prime factorisation of each of the following numbers:

1. 12

Sol:

2	12
2	6
3	3
	1

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

$= 2^2 \times 3$

8. 420

Sol:

2	420
2	210
3	105
5	35
7	7
	1

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

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

3. 8712

Sol:

2	8712
2	4356
2	2178
3	1089
3	363
11	121
11	11
	1

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

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

20. 13915

Sol:

5	13915
11	2783
11	253
23	23
	1

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

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

Ex: 2D

Find the HCF of the no.'s in each of the following, using the prime factorisation method:

1. 84, 98

Sol:

2	84
2	42
3	21
7	7
	1

2	98
7	49
7	7
	1

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

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

$\therefore$ HCF of 84 and 98 $= 2 \times 7$
$= 14$

5. 84, 120, 138

Sol:

2	84
2	42
3	21
7	7
	1

2	120
2	60
2	30
3	15
5	5
	1

2	138
3	69
23	23
	1

$\therefore 84 = 2 \times 2 \times 3 \times 7 = 2^2 \times 3 \times 7$
$120 = 2 \times 2 \times 2 \times 3 \times 5 = 2^3 \times 3 \times 5$
$138 = 2 \times 3 \times 23 = 2 \times 3 \times 23$

$\therefore$ HCF of 84, 120 and 138 $= 2 \times 3$
$= 6$

7. 1197, 5320, 4389

Sol:

3	1197
3	399
7	133
19	19
	1

2	5320
2	2660
2	1330
5	665
7	133
19	19
	1

3	4389
7	1463
11	209
19	19
	1

$\therefore$ $1197 = 3 \times 3 \times 7 \times 19$
$= 3^2 \times 7 \times 19$

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

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

$\therefore$ HCF of 1197, 5320 and 4389 = 7×19

$= 133$

Find the HCF of the numbers in each of the following, using the division method:

10. 58, 70

Sol: we have,

$$58 \overline{)70}\ 1$$
$$58$$
$$12 \overline{)58}\ 4$$
$$48$$
$$10 \overline{)12}\ 1$$
$$10$$
$$2 \overline{)10}\ 5$$
$$10$$
$$\times$$

$\therefore$ HCF of 58 and 70 is 2.

18. 1794, 2346, 4761

Sol: First we find the HCF of 1794 & 2346

P.T.O

$$
\begin{array}{r|l|l}
1794 & 2346 & 1 \\
 & 1794 & \\
\hline
552 & 1794 & 3 \\
 & 1656 & \\
\hline
138 & 552 & 4 \\
 & 552 & \\
\hline
 & \times &
\end{array}
$$

Thus, HCF 1794 and 2346 is 138.
Now, we find the HCF of 138 and 4761.

$$
\begin{array}{r|l|l}
138 & 4761 & 3 \\
 & 414 \downarrow & \\
\hline
 & 621 & \\
 & 552 & \\
\hline
69 & 138 & 2 \\
 & 138 & \\
\hline
 & \times &
\end{array}
$$

Hence, the HCF of 1794, 2346 and 4761 is 69.

Show that the following pairs are co-primes:

19. 59, 97

Sol: We have,

$$59 \overline{)97}\ 1$$
$$59$$
$$38 \overline{)59}\ 1$$
$$38$$
$$21 \overline{)38}\ 1$$
$$21$$
$$17 \overline{)21}\ 1$$
$$17$$
$$4 \overline{)17}\ 4$$
$$16$$
$$1 \overline{)4}\ 4$$
$$4$$
$$\times$$

HCF of (59, 97) = 1

$\therefore$ 59 and 97 are co-primes.

Q25 Find the greatest number which divides 615 and 963, leaving the remainder 6 in each case.

Sol: On subtracting 6 from 615 and 963 we have

$615 - 6 = 609$

$963 - 6 = 957$

The greatest number which divides 615 and 963, leaving the remainder 6 in each case is the HCF of 609 & 957.

$$609 \overline{)957}\ 1$$
$$609$$
$$348 \overline{)609}\ 1$$
$$348$$
$$261 \overline{)348}\ 1$$
$$261$$
$$87 \overline{)261}\ 3$$
$$261$$
$$\times$$

∴ The greatest number which divides 615 and 963, leaving remainder 6 in each case is 87.

Q28 Reduce each of the following fractions to the lowest terms:

(i) $\frac{161}{207}$

Sol P. T. O

Sol: We have,

$$161 \overline{)207}\ 1$$
$$161$$
$$46 \overline{)161}\ 3$$
$$138$$
$$23 \overline{)46}\ 2$$
$$46$$
$$\times$$

HCF of 161 and 207 = 23

Dividing numerator and denominator of $\frac{161}{207}$ by 23 we have

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

Ans:

Exercise 2E.

Find the LCM of the numbers given below:

1. 42, 63

Sol:

2	42, 63
3	21, 63
3	7, 21
7	7, 7
	1, 1

∴ LCM of 42 and 63 = $2 \times 3 \times 3 \times 7$

$= 126$

3. 12, 18, 20

Sol:

2	12, 18, 20
2	6, 9, 10
3	3, 9, 5
3	1, 3, 5
5	1, 1, 5
	1, 1, 1

∴ LCM of 12, 18 and 20 = $2 \times 2 \times 3 \times 3 \times 5$

$= 180$

6. 16, 28, 40, 77.

Sol:

2	16, 28, 40, 77.
2	8, 14, 20, 77
2	4, 7, 10, 77
2	2, 7, 5, 77
5	1, 7, 5, 77
7	1, 7, 1, 77
11	1, 1, 1, 11
	1, 1, 1, 1.

∴ LCM of 16, 28, 40 and 77 = $2 \times 2 \times 2 \times 2 \times 5 \times 7 \times 11$

$= 6160$

9. 48, 64, 72, 96, 108

Sol:

2	48, 64, 72, 96, 108
2	24, 3236, 48, 54
2	12, 16, 18, 24, 27
2	6, 8, 9, 12, 27
3	3, 4, 9, 6, 27
3	1, 4, 3, 2, 9
2	1, 4, 1, 2, 3
2	1, 2, 1, 1, 3
3	1, 1, 1, 1, 3
	1, 1, 1, 1, 1

LCM of 48, 64, 72, 96 and 108 =

$2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 2 \times 2 \times 3$

$= 1728.$

Q. Find the HCF and LCM of

15 2923, 3239

Sol:

37	2923
79	79
	1

41	3239
79	79
	1

$\therefore$ $2923 = 37 \times (79) \times 1$

$3239 = 41 \times (79) \times 1$

Common factor = 79

HCF = 79

LCM = $79 \times 37 \times 41$

= 119843

Q.16 For each pair of numbers, verify that their product = (HCF x LCM).

i 87, 145.

Sol:

3	87
29	29
	1

5	145
29	29
	1

We have, $87 = 3 \times 29$

and $145 = 5 \times 29$

So, the HCF of 87 and 145 = 29

And, the LCM of 87 and 145 = $29 \times 3 \times 5$
$= 435$.

Now, the product of the given numbers
$= 87 \times 145$
$= 12615$.

Product of their HCF and LCM $= 435 \times 29$
$= 12615$

$\therefore$ Product of two numbers = HCF x LCM

Q.17. The product of two numbers is 2160 and their HCF is 12. Find their LCM.

Sol: We know
Product of two numbers = 2160
HCF of two numbers = 12.
We know,
Product of two numbers = HCF x LCM

$\Rightarrow \quad 2160 = 12 \times LCM$

$\Rightarrow \quad \frac{2160}{12} = LCM$

$\Rightarrow \quad 180 = LCM$

Q.24. Find the greatest number of five digits exactly divisible by 9, 12, 15, 18 and 24.

Sol:

2	9, 12, 15, 18, 24
2	9, 6, 15, 9, 12
2	9, 3, 15, 9, 6
3	9, 3, 15, 9, 3
3	3, 1, 5, 3, 1
5	1, 1, 5, 1, 1
	1, 1, 1, 1, 1

$\therefore$ LCM of 9, 12, 15, 18 and 24 $= 2 \times 2 \times 2 \times 3 \times 3 \times 5$
$= 360$

Greatest 5 digits number = 99999

Now, divide 99999 by 360

$$\begin{array}{r|l} 360 & 99999 \\ & -720 \\ \hline & 2799 \\ & -2520 \\ \hline & 279 \end{array} \quad 277$$

The quotient when 99999 is divided by 360 is 277 and the remainder is 279.

$\therefore$ Greatest number of five digits divisible by 9, 12, 15, 18 and 24 $= 99999 - 279$
$= 99720$

2.27 The traffic lights at three different crossings change after every 48 seconds, 72 seconds and 108 seconds. If they start changing simultaneously at 8 a.m. after how much time will they change again simultaneously?

Sol: Time period after which these lights will change = LCM of 48, 72 and 108

2	48, 72, 108
2	24, 36, 54
2	12, 18, 27
2	6, 9, 27
3	3, 9, 27
3	1, 3, 9
3	1, 1, 3
	1, 1, 1

∴ LCM of 48, 72, and 108 = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

$= 432$

They will change together after every 432 seconds = 7 min 12 sec

$$60 \overline{)432}\ 7$$
$$420$$
$$\overline{12}$$

[∵ 1 min = 60 sec.

Hence they will change simultaneously at 8:07:12 a.m.

NOTE: DO REST OF THE QUESTIONS.

27. The traffic lights at three different crossings change after every 48 seconds, 72 seconds and 108 seconds. If they start changing simultaneously at 8 a.m. after how much time will they change again simultaneously?

Sol: Time period after which these lights will change = LCM of 48, 72 and 108

2	48, 72, 108
2	24, 36, 54
2	12, 18, 27
2	6, 9, 27
3	3, 9, 27
3	1, 3, 9
3	1, 1, 3
	1, 1, 1

∴ LCM of 48, 72, and 108 = $2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$
= 432

They will change together after every 432 seconds = 7 min 12 sec

$$60 \overline{)432}\ 7$$
$$\underline{420}$$
$$12$$

[∵ 1 min = 60 sec.

Hence they will change simultaneously at 8:07:12 a.m

NOTE: DO REST OF THE QUESTIONS.