3 Review

1. Complete the table :

Ans.

Given Number	Divisible by								
	2	3	4	5	6	7	8	9	10
12150	✓	✓		✓	✓				✓
364392	✓	✓	✓		✓	✓		✓	
5920	✓		✓	✓					✓
3437						✓			
49077						✓			

2. Prime numbers = 13 and 47.

Ans. Composite numbers = 6, 28, 39 and 63.

3. Fill in the blanks so as numbers are divisible by '11':

Ans. a. 4 **9** 6 **2** 1 b. 4 **9** 6 **2** 1 c. 1 **3** 4 **7** 5 d. 1 **2** 0 **0** 1

4. For finding prime numbers in between 1 and 50, follow the steps given as below :

Ans.

~~1~~	2	3	~~4~~	5	~~6~~	7	~~8~~	~~9~~	~~10~~
11	~~12~~	13	~~14~~	~~15~~	~~16~~	17	~~18~~	19	~~20~~
21	~~22~~	23	24	~~25~~	~~26~~	~~27~~	~~28~~	29	~~30~~
31	~~32~~	~~33~~	~~34~~	~~35~~	~~36~~	37	~~38~~	~~39~~	~~40~~
41	~~42~~	43	~~44~~	~~45~~	~~46~~	47	~~48~~	~~49~~	~~50~~

Step 1 : Colour with black.
Step 2 : Colour square has 2 and black all the multiple of 2.
Step 3 : Colour square has 3 and black all the multiple of 3.
Step 4 : Repeat colouring 5 and 7 and blacking their multiples, if left.
Step 5 : Colour rest of the numbers left.
All the coloured numbers are prime numbers.
i.e. 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

5. Check divisibility of the following by :

Ans. a. 15 → (i), (ii), (iii), (iv)
b. 36 → (iii), (iv)
c. 45 → (i), (ii), (iii) and (iv)
} Checked by direct division method.

d. 30 → (i) 4650 ÷ 30 or 465 ÷ 3
here, (4 + 6 + 5) = 15
∴ it B divisible by 3.

d. (ii) 7530 ÷ 30 or 753 ÷ 3
here, sum of digits = 7 + 5 + 3 = 15
∴ it B divisible by 3.

(iii) 8790 ÷ 30 or 879 ÷ 3
here sum of digits = 8 + 7 + 9 = 24
∴ it is divisible by 3.
(iv) 623460 ÷ 30 or 62346 ÷ 3
Here, sum of digits = 6 + 2 + 3 + 4 + 6 = 21
∴ it is divisible by 3.

(e) 20 (i) 962420 ÷ 20 or 96242 ÷ 20 or 96242 ÷ 2
Here, digits at ones place of 96242 is 2.
So, it is divisible by 2.
(ii) 4960 ÷ 20 or 496 ÷ 2
here, digit at ones place of 496 is 6.
so, it is divisible by 2.
(iii) 2430 ÷ 20 or 243 ÷ 2
here, digit at ones place of 243 is 3.
So, it is had divisible by 2.
(iv) 76360 ÷ 20 or 7636 ÷ 2
Here, digit at ones place of 7636 is 6.
So, it is divisible by 2.

(f) 11
(i) 2211
Sum of digits at odd places = 1 + 2 = 3
Sum of digits at even place = 1 + 2 = 3
Difference = 3 – 3 = 0
∴ 2211 is divisible by 11.
(ii) 1595
sum of digits at odd place = 5 + 5 = 10
sum of digits at even places = 9 + 1 = 10
Difference = 10 – 10 = 0
So, 11594 is divisible by 11.
(iv) 35827
sum of digits at odd places = 7 + 8 + 3 = 18
sum of digits at even places = 2 + 5 = 7
Difference = 18 – 7 = 11
so, 35827 B divisible by 11.

(g) (i)
$$\begin{array}{r} 451 \\ 21\overline{)9471} \\ -84 \\ \hline 107 \\ -105 \\ \hline 21 \\ -21 \\ \hline 0 \end{array}$$

(ii)
$$\begin{array}{r} 412 \\ 21\overline{)8652} \\ -84 \\ \hline 25 \\ -21 \\ \hline 42 \\ -42 \\ \hline 0 \end{array}$$

(iii)
$$\begin{array}{r} 326 \\ 21\overline{)6846} \\ -63 \\ \hline 54 \\ -42 \\ \hline 126 \\ -126 \\ \hline 0 \end{array}$$

(iv)
$$\begin{array}{r} 2011 \\ 21\overline{)42231} \\ -42 \\ \hline 002 \\ -0 \\ \hline 23 \\ -21 \\ \hline 21 \\ -21 \\ \hline 0 \end{array}$$

Hence, all parts are divisible by 21.

Exercise 3.2

1. Fill in the blanks :

Ans. a. One is a **factor** of every number.
b. '2' is a **even** prime number.
c. **Prime** numbers have exactly **two** factors.
d. **One** is neither prime nor composite.
e. Composite numbers have **more than two** factors.
f. The largest 2-digit prime number is **97**.
g. 17 and 19 is a pair of **twin** primes.
h. 7 and 13 are known as **co-prime** .

2. Write first three common multiples of :

a. Multiple of 3 = 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45.....
Multiple of 5 = 5, 10, 15, 20, 25, 30, 35, 40, 45.....
$\therefore$ First three common multiples of 3 and 5 are, 15, 30, 45

b. Multiple of 7 = 7, 14, 21, 28, 35, 42, 49, 56, 63, 70, 77.....
Multiple of 14 =14, 28, 42, 56, 70, 84.....
$\therefore$ First three common multiple of 7 and 14 are, 14, 28, 42.

c. Multiple of 3 = 36, 9, 12, 15, 18, 21, 24, 27, 30, 33.....
Multiple of 9 = 9, 18, 27, 36, 45, 54, 63, 72, 81.....
$\therefore$ First three multiple of 3 and 9 are 9, 18, 27

d. Multiple of 16 = 16, 32, 48, 80, 96, 112, 128, 144, 160.....
Multiple of 20 = 20, 40, 60, 80, 100, 120, 140, 160, 180, ... 240....
$\therefore$ First three common multiple of 16 and 20 are : 80, 160, 240.

3. a. 36 and 40

$1 \times 40 = 40$
$2 \times 20 = 40$
$4 \times 10 = 40$
$5 \times 8 = 40$

$\therefore$ Factors of 40 are
1, 2, 4, 5, 8, 10, 20, 40

$1 \times 36 = 36$
$2 \times 18 = 36$
$4 \times 9 = 36$
$6 \times 6 = 36$

$\therefore$ Factors factors of 36 are :
1, 2, 3, 4, 6, 9, 12, 18, 36

So, common factors of 36 and 40 are :
36 and 40 are : 2 and 4.

b. 25, 45 and 60.

$25 = 1 \times 25$
$= 5 \times 5$
Factors of 25 are
1,5,25

$45 = 1 \times 45$
$= 3 \times 15$
$= 5 \times 9$
Factors of 45 are
1,3,5,9,15,45

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

So, common factors of 25, 45 and 60 are 5.

c. 18 and 63

18 = 1 × 18
= 2 × 9
= 3 × 6

Factors of 18 are
1,2,3,6

63 = 1 × 63
= 3 × 21
= 7 × 9

Factors of 45 are
1,3,7,9,21,63

Factors of 60 are

So, common factors of 18 an 63 are 3 and 9.

d. 75, 80 and 120.

75 = 1 × 75
= 3 × 25
= 5 × 15

factors of 75 are 1, 3, 5, 15, 25, 75

80 = 1 × 80
= 2 × 40
= 4 × 20
= 5 × 16
= 8 × 10

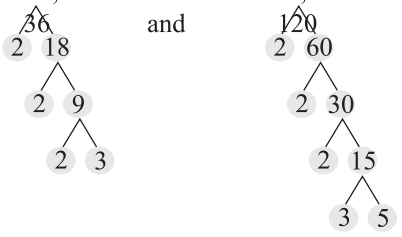
factors of 80 are :
1, 2, 4, 5, 8, 10, 16, 20, 40, 80

120 = 1 × 120
= 2 × 60
= 3 × 40
= 4 × 30
= 5 × 24
= 6 × 20
= 8 × 15
= 10 × 12

factors of 120 are
1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 40, 60, 120

So, common factors of 75, 80 and 120 are 5.

4. 36 and 120



5. Express the following as the product of primes

a.

2	210
3	105
5	35
7	7
	1

$\therefore 210 = 2 \times 3\ 5 \times 7$

b.

5	145
29	29
	1

$\therefore 145 = 5 \times 29$

c.

2	180
2	90
3	45
3	15
5	5
	1

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

2	72
2	36
2	18
3	9
3	3
	1

$\therefore 72 = 2 \times 2 \times 3 \times 3$

6. In a given figure, cat is trying to run away from dog. Cat is initially at 3rd step and dog is at first step. Answer the following :

a. 6, 9, 12, … b. 2, 4, 6, … c. 6, 12, 18, …

d. No

Exercise 3.3

1. Find the HCF by horizontal method :

a. 92, 138

2	92
2	46
23	23
	1

2	138
3	69
23	23
	1

$\therefore$ $210 = 2 \times 3\ 5 \times 7$

$138 = 2 \times 3 \times 23$

So, H.C.F. $= 2 \times 23 = 46$

b. 320 and 440

2	320
2	160
2	80
2	40
2	20
2	10
5	5
	1

2	440
2	220
2	110
5	55
11	11
	1

$\therefore$ $320 = 2 \times 2 \times 2 \times 2 \times 2 \times \times 5$

$440 = 2 \times 2 \times 2 \times 5 \times 11$

So, H.C.F. $= 2 \times 2 \times 2 \times 5 = 40$

c. 440 and 385

2	440
2	220
2	110
5	55
11	11
	1

5	385
7	77
11	11
	1

$\therefore$ $440 = 2 \times 2 \times 2 \times 5 \times 11$

$385 = 5 \times 11 \times 7$

So, H.C.F. $= 5 \times 11 = 55$

2. Find the HCF by vertical method :

a. 28, 36

2	28, 36
2	14, 18
	7, 9

After getting this line, as 7 and 9 have no common prime factor

H.C.F $= 2 \times 2 = 4$

b. 230, 322

2	230, 322
23	115, 161
	5, 7

After getting this line, as 7 and 9 have no common prime factor

H.C.F $= 2 \times 23 = 96$

c. 504, 672

2	540, 672
2	252, 336
2	126, 168
3	63, 84
7	21, 28
	3, 4

After getting this line, as 3 and 4 have no common prime factor

H.C.F $= 2 \times 2 \times 2 \times 3 \times 7 = 168$

3. Find HCF by long division method :

a. 385, 440, 495

$385\overline{)440}(1$
-385
$55\overline{)385}(1$
-385
0

$55\overline{)495}(1$
-495
0

HCF of 55 and 495 is 55.

So, HCF of 385, 440 and 495 is 55.

b. 216, 468, 828

$468\overline{)828}(1$
-468
$360\overline{)468}(1$
-360
$108\overline{)360}(3$
-324
$36\overline{)108}(3$
-108
0

Now,

$36\overline{)216}(6$
-216
0

$\therefore$ HCF of 36 and 216 is 36.

So, HCF of 216, 468 and 828 is 36.

c. 15, 36, 40

$15\overline{)36}(1$
-12
$6\overline{)15}(2$
-12
$3\overline{)6}(2$
-6
0

$3\overline{)40}(1$
-3
10
-9
$1\overline{)3}(2$
-3
0

$\therefore$ HCF of 3 and 40 is 1.

So, HCF of 15, 36 and 40 is 1.

4. Find LCM by prime factorization method :

a. 180, 200, 240

2	180
2	70
3	45
3	15
5	5
	1

2	200
2	100
2	50
5	25
5	5
	1

2	240
2	120
2	60
2	30
3	15
5	5
	1

$\therefore 180 = 2 \times 2 \times \underline{3 \times 3} \times 5$

$200 = 2 \times 2 \times 2 \times \underline{5 \times 5}$

$240 = \underline{2 \times 2 \times 2 \times 2} \times 5 \times 3$

$\therefore$ L.C.M. $= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5 \times 5$

$= 16 \times 9 \times 25$

$= 3600$

b. 15, 20, 25, 30

3 | 15
5 | 5
| 1

2 | 20
2 | 10
5 | 5
| 1

5 | 25
5 | 5
| 1

2 | 30
3 | 15
5 | 5
| 1

$\therefore \quad 15 = \underline{3} \times 5 \qquad 20 = \underline{2 \times 2} \times 5 \qquad 25 = \underline{5 \times 5} \qquad 30 = 2 \times 3 \times 5$

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

$= 12 \times 25 = 300$

c. 18, 24, 72

2 | 18
3 | 9
3 | 3
| 1

2 | 24
2 | 12
2 | 6
3 | 3
| 1

2 | 72
2 | 36
2 | 18
3 | 9
3 | 3
| 1

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

$24 = \underline{2 \times 2 \times 2} \times 3$

$72 = 2 \times 2 \times 2 \times \underline{3 \times 3}$

So, LCM $= 2 \times 2 \times 2 \times 3 \times 3$

$= 8 \times 9$

$= 72$

5. Find LCM by using division method.

a.

2 | 96, 256, 288
2 | 48, 128, 194
2 | 24, 64, 72
2 | 12, 32, 36
2 | 6, 16, 18
2 | 3, 8, 9
3 | 3, 4, 9
3 | 1, 4, 3
2 | 1, 4, 1
2 | 1, 2, 1
| 1, 1, 1

$\therefore$ LCM of 96, 256 and 288

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

$= 64 \times 9 \times 4$

$= 2304$

b.

2 | 40, 480, 560
2 | 20, 240, 280
2 | 10, 120, 280
2 | 5, 60, 70
2 | 5, 30, 35
3 | 5, 15, 35
5 | 5, 5, 35
7 | 1, 1, 7
| 1, 1, 1

$\therefore$ LCM of 40, 480 and 560

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

$= 32 \times 15 \times 7$

$= 32 \times 105$

$= 3360$

c.

2	140, 210, 350
2	70, 105, 175
3	35, 105, 175
5	35, 35, 175
5	7, 7, 35
7	7, 7, 7
	1, 1, 1

$\therefore$ LCM of 140, 210 and 350
$= 2 \times 2 \times 3 \times 5 \times 5 \times 7$
$= 12 \times 25 \times 7$
$= 84 \times 25$
$= 2100$

6. First find HCF of 105 and 180.

$105\overline{)180}(1$
-105
$75\overline{)105}(1$
-75
$30\overline{)75}(3$
-60
$15\overline{)30}(3$
-30
0

H.C.F of 105 and 180 is 15.
Hence, the required greatest number is 15.

7. We find the HCF of (157 – 5), (178 – 7) and (218 – 9).

$152\overline{)171}(1$
-152
$19\overline{)152}(8$
-152
0

Now,

$19\overline{)209}(11$
$-19\downarrow$
19
-19
0

HCF of 152, 171 and 209 is 19.
Hence, the required number is 19.

8. We find LCM of 20, 25 and 50.

2	20, 25, 50
2	10, 25, 25
5	5, 25, 25
5	1, 5, 5
	1, 1, 1

$\therefore$ LCM of 20, 25 and 50
$= 2 \times 2 \times 5 \times 5$
$= 100$

$\therefore$ the required number = 100 + 9 = 109
Hence, the required smallest number is 109.

9. Product of two number = 288
and HCF of these numbers = 4
LCM = ?
we have,

$$\text{LCM} = \frac{\text{Product of two number}}{\text{HCF}}$$

$$= \frac{288}{4} = 72$$

Hence, the required LCM is 72.

10.

$$45\overline{)60}(1$$
$$-45$$
$$15\overline{)45}(3$$
$$-45$$
$$0$$

$\therefore$ HCF of 45 and 60 is 15.

2	45, 60
2	45, 30
3	45, 15
3	15, 5
5	5, 5
	1, 1

product of two numbers = $45 \times 60 = 2700$
& LCM $\times$ HCF $= 15 \times 180 = 2700$
Hence verified

11.

2	84, 108, 180, 216
2	42, 54, 90, 108
2	21, 27, 45, 54
3	21, 27, 45, 27
3	7, 9, 15, 9
3	7, 3, 5, 3
5	7, 1, 5, 1
7	7, 1, 1, 1
	1, 1, 1, 1

$\therefore$ LCM of 84, 108, 180 and 216
$= 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 7$
$= 8 \times 27 \times 35 = 7560.$

12.

2	32, 36, 48, 54
2	16, 18, 24, 27
2	8, 9, 12, 27
2	4, 9, 6, 27
2	2, 9, 3, 27
3	1, 9, 3, 27
3	1, 3, 1, 9
3	1, 1, 1, 3
	1, 1, 1, 1

$\therefore$ LCM of 32, 36, 48 and 54
$= 2 \times 2 \times 2 \times 3 \times 3 \times 3$
$= 32 \times 27$
$= 864$

13.

2	2, 3, 6
3	1, 3, 3
	1, 1, 1

LCM of 2, 3 and 16
$= 2 \times 3 = 6$
and common multiple of 2, 3 and 6 is 6.

MCQs

Tick (✓) the correct option :

Ans. 1. iv **2.** ii **3.** iv **4.** iv **5.** iii