

Multiples and Factors

Notebook Task:

Q1. Find the H.C.F of each set of numbers using prime factorization method.

- i. 72 , 48 ii. 60 , 84 , 108 iii. 70 , 110 , 150

Q2. Find the H.C.F of given numbers using long division method.

- i. 77 , 33 , 22 ii. 48 , 87 , 6 iii. 99 , 88

Q3. Find the L.C.M of each set of numbers using prime factorization method.

- i. 27 , 24 , 15 ii. 84 , 60 iii. 24 , 36 , 66

Q4. Find L.C.M of given numbers using division method:

- i. 210 , 230 , 250 , 260 ii. 17 , 26 , 53 iii. 126 , 168

Q5. Find the relationship between H.C.F and L.C.M of:

- i. 158 , 200 ii. 49 , 98

Q6. Identify the square numbers in the following numbers:

- i. 169 ii. 144 iii. 18 iv. 66

Q7. Calculate the squares of the following numbers.

- i. -8 ii. 56 iii. -34 iv. -6 v. 94

Q8. What is the highest number of trees that can be arranged in rows of 14 , 18 or 40 in each row.

Q9. Hassan is decorating his room with balloons. He has 32 purple balloons, 24 pink balloons and 16 blue balloons. He wants to have a same number of each colour. What is the highest number of balloons are used?

Q10. Find the least length of skipping rope which can be cut into whole number of pieces of lengths 50 cm, 80cm and 90cm.

Q.1 Find the H.C.F of each using prime factorization method.

i) 72, 48

2	72
2	36
2	18
3	9
3	3
	1

2	48
2	24
2	12
2	6
3	3
	1

$$(2) \times (2) \times (2) \times 3 \times (3)$$

$$2 \times 2 \times 2 \times 3 = 24$$

ii) 60, 84, 108

2	60
2	30
3	15
5	5
	1

2	84
2	42
3	21
7	7
	1

2	108
2	54
3	27
3	9
3	3
	1

$$(2) \times (2) \times (3) \times 5$$

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

$\frac{5}{1}$
Q.1

iii) 70, 110, 150

2	70
7	35
5	5
	1

2	110
5	55
11	11
	1

2	150
3	75
5	25
5	5
	1

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

$$2 \times 5 = 10$$

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Q.2 Find the H.C.F of given numbers using long division method.

i) 77, 33, 22

$$\begin{array}{r} 33 \overline{) 77} \\ \underline{66} \\ 11 \overline{) 33} \\ \underline{33} \\ 0 \end{array}$$

$$\begin{array}{r} 11 \overline{) 22} \\ \underline{22} \\ 0 \end{array}$$

So, The required H.C.F is 11.

iii) 48, 87, 6

$$\begin{array}{r} 48 \overline{) 87} \\ \underline{48} \\ 39 \overline{) 48} \\ \underline{39} \\ 9 \overline{) 39} \\ \underline{36} \\ 3 \end{array}$$

$$\begin{array}{r} 3 \overline{) 6} \\ \underline{6} \\ 0 \end{array}$$

So, The required H.C.F is 3

Q.2

) 99, 88

$$\begin{array}{r} 1 \\ 88 \overline{) 99} \\ \underline{88} \\ 11 \end{array} \quad \begin{array}{r} 88 \\ \underline{88} \\ 0 \end{array}$$

So, The required H.C.F is 11.

Q.3

Find the L.C.M of each set of numbers using prime factorization method.

i) 27, 24, 15

$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

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

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

$$\begin{aligned} 27 &= 3 \times 3 \times 3 \\ 24 &= 2 \times 2 \times 2 \times 3 \\ 15 &= 3 \times 5 \end{aligned}$$

$$\begin{aligned} \text{L.C.M} &= 3 \times 3 \times 2 \times 2 \times 2 \times 5 \\ &= 1080 \end{aligned}$$

ii) 84, 60

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

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

$$\begin{aligned} 84 &= 2 \times 2 \times 3 \times 7 \\ 60 &= 2 \times 2 \times 3 \times 5 \end{aligned}$$

$$\begin{aligned} \text{L.C.M} &= 2 \times 2 \times 3 \times 7 \times 5 \\ &= 420 \end{aligned}$$

5
Q.3
iii) 24, 36, 66

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

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

$$\begin{array}{r|l} 2 & 66 \\ \hline 3 & 33 \\ \hline 11 & 11 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 24 &= 2 \times 2 \times 2 \times 3 \\ 36 &= 2 \times 2 \times 3 \times 3 \\ 66 &= 2 \times 3 \times 11 \end{aligned}$$

$$\begin{aligned} \text{L.C.M.} &= 2 \times 2 \times 3 \times 3 \times 2 \times 11 \\ &= 792 \end{aligned}$$

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Q.4 Find L.C.M of given numbers using division method.

i) 210, 230, 250, 260

2	210, 230, 250, 260
2	105, 115, 125, 130
3	105, 115, 125, 65
5	35, 115, 125, 65
5	7, 23, 25, 13
5	7, 23, 5, 13
	7, 23, 1, 13

$$\begin{aligned}\text{L.C.M} &= 2 \times 2 \times 3 \times 5 \times 5 \times 5 \times 7 \times 23 \times 13 \\ &= 3139500\end{aligned}$$

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Q.4

ii) 17, 26, 53

2	17, 26, 53
13	17, 13, 53
17	17, 1, 53
53	1, 1, 53
	1, 1, 1

$$\begin{aligned} \text{L.C.M} &= 2 \times 13 \times 17 \times 53 \\ &= 23,426 \end{aligned}$$

iii) 126, 168

2	126, 168
2	63, 84
2	63, 42
3	63, 21
3	21, 7
7	7, 7
	1, 1

$$\begin{aligned} \text{L.C.M} &= 2 \times 2 \times 2 \times 3 \times 3 \times 7 \\ &= 504 \end{aligned}$$

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Q.5

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

i) 158, 200

$$\begin{array}{r|l} 2 & 158 \\ \hline 79 & 79 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 200 \\ \hline 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

Prime factors of

$$158 = 2 \times 79$$

$$200 = 2 \times 2 \times 2 \times 5 \times 5$$

$$\text{H.C.F} = 2$$

$$\text{L.C.M} = 2 \times 2 \times 2 \times 5 \times 5 \times 79$$

$$\text{Hence L.C.M} = 15800$$

$$\text{Now multiply H.C.F and L.C.M} = \text{Product of two numbers}$$

$$2 \times 15800$$

$$= 158 \times 200$$

$$31600$$

$$= 31,600$$

So

$$\text{L.H.S}$$

=

$$\text{R.H.S}$$

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Q.5 ii) 49, 98

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

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

Prime factors of:

$$49 =$$

$$7 \times 7$$

$$98 =$$

$$2 \times 7 \times 7$$

$$\text{H.C.F} = 7 \times 7 = 49$$

$$\text{L.C.M} = 2 \times 7 \times 7 = 98$$

Now multiply H.C.F and L.C.M = Product of two numbers

$$49 \times 98$$

$$= 49 \times 98$$

$$4,802$$

$$= 4,802$$

$$\text{So, L.H.S}$$

$$= \text{R.H.S}$$

Q.6

i) 169

$$= 13 \times 13$$

$$= (13)^2$$

$$= 169$$

169 is square number

ii) 18

18 is not a square number

ii) 144

$$= 12 \times 12$$

$$= (12^2)$$

$$= 144$$

144 is square number.

iii) 166

166 is not a square number.

Q.7 Calculate the squares of the following numbers.

i) -8

$$= (-8) \times (-8) = (-8)^2$$

$$= 64$$

64 is square number

ii) 56

$$= 56 \times 56 = (56^2)$$

$$= 3,136$$

3,136 is a square number

$$iii) (-34)$$

$$= (-34) \times (-34) = (-34)^2$$

$$= 1156$$

1156 is a square number

$$iv) -6$$

$$= (-6) \times (-6) = (-6)^2$$

$$= 36$$

36 is a square number

$$v) 94$$

$$= 94 \times 94 = (94)^2$$

$$8836$$

8836 is a square number.

Q. 8 What is the highest number of trees that can be arranged in rows of 14, 18, or 40 in each row.

$$\begin{array}{r} 14 \overline{) 18} \\ \underline{14} \\ 4 \end{array}$$

$$\begin{array}{r} 4 \overline{) 14} \\ \underline{12} \\ 2 \end{array}$$

$$\begin{array}{r} 2 \overline{) 4} \\ \underline{4} \\ \times \end{array}$$

$$\begin{array}{r} 2 \overline{) 40} \\ \underline{40} \\ \times \end{array}$$

The highest number of trees that can be arranged in rows of 14, 18 or 40 is 2

Hassan is decorating ----- what is the highest number of balloons are used?

$$\begin{array}{r} 1 \\ 24 \overline{) 32} \\ \underline{24} \\ 8 \end{array}$$

$$\begin{array}{r} 2 \\ 8 \overline{) 16} \\ \underline{16} \\ x \end{array}$$

The highest number of balloons of ~~32~~ ~~24~~ 32, 24, 16 is 8.

Q. 10
- Answer

$$\begin{array}{r} 2 \overline{) 50} \\ 5 \overline{) 25} \\ 5 \overline{) 5} \\ 1 \end{array}$$

$$\begin{array}{r} 2 \overline{) 80} \\ 2 \overline{) 40} \\ 2 \overline{) 20} \\ 2 \overline{) 10} \\ 5 \overline{) 5} \\ 1 \end{array}$$

$$\begin{array}{r} 2 \overline{) 90} \\ 3 \overline{) 45} \\ 3 \overline{) 15} \\ 5 \overline{) 5} \\ 1 \end{array}$$

$$\begin{array}{l} (2) \times 5 \times (5) \\ (2) \times 2 \times 2 \times 2 \times (5) \\ (2) \times 3 \times 3 \times (5) \end{array}$$

Common factor = 2×5

Non common factor = $2 \times 2 \times 2 \times 3 \times 3 \times 5$

$$2 \times 5 \times 2 \times 2 \times 2 \times 3 \times 3 \times 5$$

$$= 3600$$

The least length of skipping rope is
3600.