

HCF & LCM

HCF and LCM



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Placement for All. All for Placement

This Video Completely covers the problems on "HCF & LCM" which is more than sufficient for all kind of placement Exams eg: TCS/WIPRO/AMCAT/ELITMUS/CoCubes and all other placement Exams.

HCF and LCM by : Pratik Shrivastava(10 years of industry experience and best Aptitude trainer)

HCF and LCM

Q1. Find the HCF of 169 and 182 ?

a. 8 b. ~~13~~ c. 17 d. none of these

Solution:

TRICK ✓

169,182 ✓

$$\checkmark 13 = \text{HCF}$$

HCF = difference of factors of diff

13 ~~(169)~~ ~~(182)~~ 14.

diff = 13 ✓

$$\text{HCF} = 13$$

HCF = 13 ✓

HCF: 5

HCF = 5 ✓

5,10

$$\begin{array}{r} 10 \\ 10 \\ \hline 20 \end{array}$$
$$\text{HCF} = \text{GCD}$$

↓
Highest common factor

$$\checkmark \begin{bmatrix} 10 = 5 \times 2 \\ 5 = 5 \times 1 \end{bmatrix} \checkmark$$

HCF and LCM

Q2. Find the HCF of 21 and 35 ?

~~a.7~~ b.14 c.28 d.5

Solution:

21, 35

diff = 14

$$= 2 \times 7$$

HCF = 7

$$\begin{array}{r} \textcircled{21} \textcircled{33} \times \\ \hline 14 \end{array}$$
$$3 \overline{) 21.355}$$

3 5
2+3=5
9

14 x

7 = HCF

HCF and LCM

Q3. Find the HCF of 22 and 27 ?

a.1 b.11 c.9 d.3

Solution:

HCF 22 27
 $\frac{22}{5}, \frac{27}{5} \times \times$
 $1 = \text{HCF} \checkmark$

HCF and LCM

Q4. Find the HCF of 35, 45 and 50 ?

a.5 b.10 c.15 d.None

Solution:

$35, 45, 50$
smallest diff = 5 ✓
HCF = 5

previous

$$\begin{array}{r} 45 - 35 = 10 \checkmark \\ 50 - 45 = 5 \\ 50 - 35 = 15 \checkmark \end{array}$$

HCF and LCM

Q5. Find the HCF of 12, 30 and 84 ?

a.12 b.9 c.6 d.18

Solution:

$$\begin{array}{r} 72 \\ 12, 30, 84 \\ \hline 18 \quad 54 \end{array}$$

Smallest diff = 18^x ✓

$$\frac{18}{2} = 9^x$$

$$\frac{18}{3} = \underline{\underline{6}} = \text{HCF}$$

HCF and LCM

Q6 Find the HCF of 150, 210 and 300 ?

a.30 b.60 c.150 d.5

Solution:

HCF & LCM ✓
Option ✓

HCF 150, 210, 300
60 90

Smallest diff = 60 x

$$\frac{60}{2} = \frac{30}{\text{HCF}}$$

$$\begin{aligned} 150 &= 30 \times 5 \\ 210 &= 30 \times 7 \\ 300 &= 30 \times 10 \end{aligned}$$

$$\text{HCF} = 30$$

$$\begin{array}{r} 5 \quad 7 \quad 10 \\ \hline 150, 210, 300 \\ \hline 60 \quad 30 \end{array}$$

HCF and LCM

Q7. Find the LCM of 6, 12, 24 and 48 ?

a.48 b.96 c.24 d.None

Solution:

LCM of 6, 12, 24, 48 → 48 ✓
6, 12, 24, 48

$$2 \mid 6, 12, 24, 48$$

$$2 \mid 3, 6, 12, 24$$

$$2 \mid 3, 3, 6, 12$$

$$3 \mid 3, 3, 3, 6$$

$$1, 1, 1, 2$$

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 2$$

$$48$$

eg:

$$\begin{array}{l} \text{LCM} \\ 2, 4, 8 \Rightarrow 8 \\ \hline \text{LCM}(8) \checkmark \\ 2, 4, 8 \checkmark \end{array}$$

$$\begin{array}{r} 2 \mid 24, 8 \\ 2 \mid 12, 4 \\ \hline 1, 1, 2 \end{array}$$

$$2 \times 2 \times 2 = 8$$

HCF and LCM

Q8. Find the LCM of 4, 12, 16 and 24 ?

a.48 b.96 c.24 d.None

Solution:

$$\text{LCM of } 4, 12, 16, 24 = 48$$

Next fact
LCM

$$\begin{array}{r} 4, 12, 16, 24 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \times 1 \\ 48 \\ \hline 72 \quad 24 \times 3 \end{array}$$

$$\text{LCM} = 48$$

HCF and LCM

Q9. Find the LCM of 3, 9, 13 and 18?

a. 36 b. 18 c. 234 d. None

Solution:

LCM of 3, 9, 13 and 18 ✓ Next

$\begin{array}{r} 13 \\ 13 \end{array}$
 $\begin{array}{r} 26 \\ 13 \end{array}$
 $\begin{array}{r} 39 \\ 13 \end{array}$
 $\begin{array}{r} 13 \times 2 \\ 13 \end{array}$
 $\begin{array}{r} 13 \times 3 \\ 13 \end{array}$

$\begin{array}{c} \checkmark \checkmark \checkmark \checkmark \\ 3, 9, 13, 18 \end{array} \Rightarrow 18 \times 13 = 234$

Prime No. → Prime
 $18 \times (10+3) = 180 + 54 = 234$

LCM of 3, 9, 7, 27 $\Rightarrow 27 \times 7 = 189$

HCF and LCM

Q10. Find the LCM of $\frac{3}{4}$, $\frac{6}{12}$, and $\frac{9}{16}$?

a. $\frac{18}{4}$ b. 18 c. 234 d. None

Solution:

LCM of $\frac{3}{4}, \frac{6}{12}, \frac{9}{16} = \frac{18}{4}$

$\begin{array}{r} 3, 6, 9 \\ 3, 6, 9 \end{array} \Rightarrow \frac{18}{3, 6, 9}$

LCM of fractions = $\frac{\text{LCM of Numerator}}{\text{HCF of denominator}}$

$\begin{array}{r} 12 \\ 4, 12, 16 \\ 4 \end{array}$
 $\begin{array}{r} 12 \\ 4, 12, 16 \\ 4 \end{array}$
 Smallest no = 4
HCF = 4

$\begin{array}{r} 3, 6, 9 \text{ LCM} \\ 4, 12, 16 \text{ HCF} \\ \hline = \frac{18}{4} \end{array}$

HCF and LCM

Q11. Find the Lowest common multiple of 24, 36 and 40.

a. 120 b. 240 c. 360 d. 480

Solution:

LCM

LCM of 24, 36 & 40. ✓

1. Option attack

$\begin{array}{r} \text{LCM} \\ 24, 36, 40 \end{array}$
 $\begin{array}{r} 120 \\ 24, 36, 40 \end{array}$
 $\begin{array}{r} 240 \\ 24, 36, 40 \end{array}$
 $\begin{array}{r} 360 \\ 24, 36, 40 \end{array}$
 $\begin{array}{r} 480 \\ 24, 36, 40 \end{array}$

2.

$24 = 2 \times 2 \times 2 \times 3$
 $36 = 2 \times 2 \times 3 \times 3$
 $40 = 2 \times 2 \times 2 \times 5$

$\begin{array}{c} \checkmark \checkmark \checkmark \checkmark \checkmark \\ 2 \times 2 \times 3 \times 2 \times 3 \times 5 \\ 36 \times 10 \\ \text{LCM} = 360 \end{array}$

$36 \times 5 = 180$
 $36 \times 10 = 360$

15

HCF and LCM

Q12. what is the smallest number, which when divided by 12, 15, 18 and 27 leaves remainder of 8, 11, 14 and 23.

- a. 526 b. 536 c. 446 d. none

Solution:

proceeds

✓ Best way

$$\begin{array}{r} 612 \overline{) 53644} \\ \underline{48} \\ 56 \\ \underline{48} \\ 8 \end{array}$$

Lcm

$12 = 2 \times 2 \times 3$
 $15 = 3 \times 5$
 $18 = 2 \times 3 \times 3$
 $27 = 3 \times 3 \times 3$

$$540 - 4 = 536 \quad \checkmark$$

$\begin{array}{ccccccc} & \checkmark & & \checkmark & & \checkmark & & \checkmark \\ 4 & \downarrow & 12, & 15, & 18, & 27 \\ & \downarrow & 4 & \downarrow & 4 & \downarrow & 4 \\ & 8 & 11 & 9 & 4 & 3 \end{array}$

$\Rightarrow \underline{3 \times 3 \times 3 \times 2 \times 5} \times 3$

$\Rightarrow \underline{540} \text{ (LCM)}$

Least

HCF and LCM

Q13 Find the Least number which when divided by 2,3,4,5,6 leaves a remainder of 1 but it is divided by 7 completely.

- a.305 (b.301) c.402 d.None

Solution:

فوب

process:

5, 10, 15

✓ option attack

$$\begin{array}{r} 7 \overline{) 301} \quad (43 \\ \underline{28} \\ 21 \\ \underline{21} \\ 0 \end{array}$$

$$60k+1 \Rightarrow k=5$$

$$60 \times 5 + 1 = 301$$

 $60K + 1$

Least

$2, 3, 4, 5, 6 \Rightarrow 30$
 $60 + 1 = 61$
 $61 = 56K + 4K + 1$
 7

60 (LCM)

$$\begin{array}{r} 4 \times 1 + 1 \\ 4 \times 2 + 1 \\ 4 \times 3 + 1 \\ 4 \times 4 + 1 \\ 4 \times 5 + 1 \\ 21 \\ \hline 4 \times 5 + 1 \\ 7 \\ \hline = \frac{21}{7} = 3 \end{array}$$

HCF and LCM

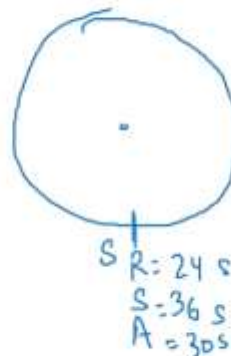
Q14. Three friends Rudra, Siva and Anvesh start to run around a circular stadium. They complete a revolution in 24, 36 and 30 seconds respectively. After how many minutes will they meet at the starting point?

- A) 60 B) 120
C) 36 D) 6

$$\frac{36 \text{ sec}}{60} = 6 \text{ min}$$



$$12.4 = \cancel{4 \text{ min}}$$



LCM of 24, 30, 36

$24 \times 3 = 72$
 $30 \times 2 = 60$
 $36 \times 1 = 36$

LCM of 72, 60, 36

$72 \times 5 = 360$
 $60 \times 6 = 360$
 $36 \times 10 = 360$

LCM of 24, 30, 36 = 360

HCF and LCM

Q15 Find the least number which is exactly divisible by 12, 15, and 20.

- a. 40 x
- b. 50 x
- c. 60 ✓
- d. 80

Solution:

LCM (60)
12, 15, 20

option attack

20×3
 20×2

$12, 15, 20 \Rightarrow 20, 40, 60$

HCF and LCM

Q16 Find the largest number of 4-digits divisible by 12, 15 and 18.

- a. 9900 ✓
- b. 9750 ✓
- c. 9450 ✓
- d. 9000 ✓

Solution:

Process

✓ largest 4 digit no = 9999

LCM of 12, 15, 18 = 180

LCM of 12, 15, 18 =

12, 15, 18

$12 = 2 \times 2 \times 3$

$15 = 3 \times 5$

$18 = 2 \times 3 \times 3$

$3 \times 2 \times 3 \times 2 \times 5$
 $18 \times 10 = 180$

16

180) 9999 (55
900
999
900
99

9999
- 99
9900
largest 4

LCM (2, 4, 8) = 8

HCF and LCM

Q17 H.C.F. of two numbers is 13. If these two numbers are in the ratio of 15: 11, then find the numbers.

- a. 230, 140
- b. 215, 130
- c. 195, 143 ✓
- d. 155, 115

Solution:

Ratio

1st : 2nd = 15 : 11

1st = $15x$

2nd = $11x$

$15x(10+3)$

HCF of $15x$ & $11x = 13$

1st = $15x = 15 \times 13 = 150 + 45 = 195$

2nd = $11x = 11 \times 13 = 110 + 33 = 143$

option

195, 143
52, 26, 13

$\frac{52}{2} = 26$
 $\frac{52}{4} = 13$

$\frac{15 \times 13}{13} = 15$
 $\frac{11 \times 13}{13} = 11$

HCF = $x = 13$

HCF and LCM

Q18. Find the least number, which when divided by 12, 15, 20 and 54 leaves a remainder of 8 in each case

- a. 548
- b. 540
- c. 532
- d. 524

Solution:

$$\begin{array}{r} 540 + 8 \\ \hline 548 \end{array}$$

least number ✓ ✓ ✓ ✓
 $540 \rightarrow 12, 15, 20, 54$ ✓

$$\begin{aligned} \text{LCM} &= 3 \times 2 \times (2 \times 5) \times 9 \\ &= 54 \times 10 \\ &= 540 \end{aligned}$$

$$\begin{aligned} 12 &= 2 \times 2 \times 3 \\ 15 &= 3 \times 5 \\ 20 &= 2 \times 2 \times 5 \\ 54 &= 2 \times 3 \times 3 \times 3 \end{aligned}$$

HCF and LCM

Q19. The traffic lights at three different road crossings change after every 40 sec, 72 sec and 108 sec respectively. If they all change simultaneously at 5 : 20 : 00 hours, then find the time at which they will change simultaneously.

- a. 5 : 28 : 00 hrs
- b. 5 : 30 : 00 hrs
- c. 5 : 38 : 00 hrs
- d. 5 : 40 : 00 hrs

5 : 20 : 00 hours

$$\begin{array}{r} 108 \times 5 \\ 108 \times 10 \end{array}$$

$$\begin{aligned} \text{LCM} &= 2 \times 2 \times (2 \times 5) \times 3 \times 3 \times 3 \Rightarrow 40, 72, 108 \Rightarrow \frac{108}{4} = 27 \\ &= 4 \times 27 \times 10 \\ &= 1080 \text{ sec} \end{aligned}$$

$$\begin{array}{r} 18 \\ 1080 \div 60 \Rightarrow \\ \hline 18 \text{ min} \end{array}$$

$$\begin{array}{r} 5 : 20 : 00 \\ + 18 \\ \hline 5 : 38 : 00 \end{array}$$

$$\begin{aligned} 40 &= 2 \times 2 \times 2 \times 5 \\ 72 &= 2 \times 2 \times 2 \times 3 \times 3 \\ 108 &= 2 \times 2 \times 3 \times 3 \times 3 \end{aligned}$$

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HCF and LCM

Q20. A rectangular courtyard 4.55 meters long and 5.25 meters wide is paved exactly with square tiles of same size. Find the largest size of the tile used for this purpose?

- a. 25 cm
- b. 45 cm
- c. 21 cm
- d. 35 cm

Solution:

HCF
 largest size = HCF
 35 cm



HCF of 4.55m, 5.25m

$$\begin{array}{r} 35 \overline{) 455} \\ \underline{35} \\ 105 \end{array}$$

$$\begin{array}{r} 35 \overline{) 525} \\ \underline{35} \\ 175 \end{array}$$

HCF and LCM

Q21. The product of two numbers is 2160 and their HCF is 12. What is their LCM?

a. 180 b. 140 c. 240 d. 540

Solution:

Handwritten note: $2, 4 \rightarrow 8$
LCM HCF = 8
 4×2

$$\boxed{\text{LCM} \times \text{HCF} = \text{product of 2 no}}$$

$$\text{LCM} \times 12 = 2160$$

$$\text{LCM} = \frac{2160}{12} = 180$$

HCF and LCM

Q22. If the HCF and LCM of two consecutive (positive) even numbers be 2 and 84 respectively, then the sum of numbers is:

a. 30 b. 26 c. 14 d. 34

Solution:

Handwritten note: $12 + 14 = 26$

Two positive even no = $(2x+2), (2x+4)$

LCM $(2x+2) = 2(x+1)$ $(2x+4) = 2(x+2)$
HCF = 2

$$\text{LCM} = 2 \times (x+1) \times (x+2)$$

$$2 \times (x+1)(x+2) = 84$$

$$x^2 + 2x + x + 2 = 42$$

$$x^2 + 3x + 2 - 42 = 0$$

$$x^2 + 3x - 40 = 0$$

$$x^2 + 8x - 5x - 40 = 0$$

$$x(x+8) - 5(x+8) = 0$$

$$x = 5, -8$$

HCF and LCM

Q23. A number between 1000 and 2000 which when divided by 30, 36 and 80 gives a remainder of 11 in each case is

a. 1153 b. 1451 c. 1641 d. 1712

Solution:

Handwritten note: $1000 \rightarrow 2000$

$$\begin{array}{r} 720K + 11 \\ 1440 + 11 \\ \hline 1451 \end{array}$$

Handwritten note: $K=2$

Handwritten note: $2 \times 2 \times 3 \times 5 \times 3 \times 4 = 720$

Handwritten note: $30, 36, 80 \rightarrow 720$

Handwritten prime factorizations:
 $30 = 2 \times 3 \times 5$
 $36 = 2 \times 2 \times 3 \times 3$
 $80 = 2 \times 2 \times 2 \times 2 \times 5$

HCF and LCM

Q24. The ratio of two numbers is 3:4 and their LCM is 120. the sum of numbers is :
a. 70 b. 35 c. 140 d. 105

Solution:

$$1^{\text{st}} : 2^{\text{nd}} = 3 : 4$$

$$\begin{array}{l} 1^{\text{st}} = 3x \\ 2^{\text{nd}} = 4x \end{array}$$

$$\text{LCM of } 3x \text{ \& } 4x = 12x$$

$$12x = 120$$

$$\frac{x=10}{3x+4x}$$

$$7x$$

$$7 \times 10 = 70$$