

LCM AND HCF

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Class: VI, Mathematics

F⁺

SOLUTIONS

TEACHING TASK

01.

02. Factors of 27 = { 1, 3, 9, 27 }

A) Factors of 18 = { 1, 2, 3, 6, 9, 18 }

$$H.C.F = 9.$$

B) Factors of 36 = { 1, 2, 3, 4, 9, 12, 18, 36 }

$$H.C.F = 9$$

D) Factors of 45 = { 1, 3, 15, 45, 9, 5 }

$$H.C.F = 9$$

Ans: A, B, C, D

03 H.C.F = 6

Ans: D

04 H.C.F = 8

Ans: D

05

06 H.C.F = 11

two numbers are $11 \times 3 \times 2$ and 11×7

Ans: A

07 H.C.F { 24, 36 } = 12 = $2^2 \times 3$

Ans: B

08 H.C.F { 60, 75 } = 15

09 H.C.F { 45, 75 } = 15

Ans: C

10.	$L.C.M \{ 12, 18 \} = 36$	Ans: D
11.	$H.C.F \{ 108, 135 \} = 27$	Ans: D
12.	$H.C.F \{ 119, 187 \} = 17$	Ans: B
13.	$H.C.F \{ 56, 126, 189 \} = 14$	Ans: D
14.	$L.C.M \{ 24, 36, 40 \} = 360$	Ans: C
15.	$252 = 2 \times 2 \times 3 \times 3 \times 7$	Ans: A
16.	$H.C.F = \{ 48, 36, 72, 24 \} = 12$ $L.C.M \{ 48, 36, 72, 24 \} = 144$ $\therefore \frac{L.C.M}{H.C.F} = \frac{144}{12} = 12$	Ans: A
17.	462 is nearest to 457 and it is divisible by 11	Ans: C
18.	$product = L.C.M \times H.C.F$ $24 = 12 \times x$ $\Rightarrow x = 2$	Ans: B
19.		
20.		
<u>ADVANCED LEVEL QUESTIONS</u>		
01.	$HCF \{ 90, 120 \} = 30 = 2 \times 3 \times 5$	
02.	$HCF \{ 420, 504 \} = 84$	Ans: D
03.	a is equal to b	Ans: D

04 A) $a \times b = \text{LCM} \times \text{HCF}$

(3)

c) product of numbers = product of LCM & HCF
 Ans: A, C

05 $\text{LCM} \{40, 60\} = 120 = 2^3 \times 3 \times 5$

Ans: B

06
$$\begin{array}{r} 720 \overline{) 900} \quad (1) \\ \underline{720} \\ 180 \overline{) 180} \quad (4) \\ \underline{720} \\ 0 \end{array}$$

H.C.F = 180

Ans: B, C

07. $\text{LCM} \left\{ \frac{1}{4}, \frac{3}{5}, \frac{2}{3} \right\} = \frac{\text{LCM} \{1, 3, 2\}}{\text{HCF} \{1, 3, 2\}} = \frac{6}{1} = 6$

08

09. $p = a \times \underline{b} \times \underline{c} \times \underline{d}$; $q = \underline{b} \times \underline{c} \times \underline{d} \times f$

$\therefore \text{HCF} \frac{1}{\cancel{b}, \cancel{c}, \cancel{d}} bcd$

Ans: A

10 $\text{HCF} \{15, 25, 35\} = 5$

Ans: A

11. $\text{HCF} \{15, 25, 35, 20\} = 5$

It has no effect on the HCF

Ans: C

12 Assertion (A): Conceptual (True)

Reason (R): Conceptual (True)

Ans: A

13. Assertion (A): True

Reason (R): True

Ans: A

14. Assertion: $HCF\{48, 72\} = 24$ (True) (4)

Reason (R): True

Ans: A -

15. Assertion: True

Reason (R): Conceptual (True)

Ans: A

16. Statement I: $L.C.M.\{120, 20\} = 120$ (True)

Statement II: True

Ans: A

17. Statement I: $LCM\{3, 5\} = 15$ (True)

Statement II: True

Ans: A

18. $HCF\{3, 4\} = 12$

Ans: 12

19. $HCF\{8, 12, 16\} = 4$

Ans: 4

20. $HCF\{18, 24, 36\} = 12$

Ans: 12

21. Let the number to be subtracted be x

$$G.C.D\{510-x, 270-x\} = 24$$

$$\text{Let } a = 510-x, \quad b = 270-x$$

The difference b/w ~~and~~ a & b must also be a multiple of the G.C.D.

$$\therefore a - b = 240 \rightarrow \textcircled{1}$$

Since a & b are multiples of 24, we write

$$a = 24m, \quad b = 24n$$

$$510 - x = 24m; \quad 270 - x = 24n$$

$$\therefore (510 - x) - (270 - x) = 24(m - n) \Rightarrow m - n = 10$$

G.C.D(m, n) = 1, possible pairs (11, 1), (~~10, 0~~)

$$\therefore \text{ } 510 - x = 24m \Rightarrow x = 510 - 24(11) = 246$$

\therefore The no. to be subtracted = 246

22 a) $H.C.F \{ 5, 7 \} = 35$

b) LCM of prime nos = product of the nos.

c) $LCM \{ 8, 9, 25 \} = 1800$

d) $HCF \{ 8, 9, 25 \} = 1$ Ans: 9, 1, 5, 8

(5)

23 a) product of two numbers = $HCF \times LCM$

b) ~~Co-prime~~ twin primes

c) ~~twin primes~~ co-primes

d) Co-primes

Ans: 8, 5, 9, 9

LEARNER'S TASK

CUB'S

01. 1

Ans: A

02. $HCF \{ 45, 75 \} = 15$

$$\begin{array}{r} 45 \overline{) 75} (1 \\ \underline{45} \\ 30 \\ 30 \overline{) 45} (1 \\ \underline{30} \\ 15 \\ 15 \overline{) 30} (2 \\ \underline{30} \\ 0 \end{array}$$

Ans: B

03. $HCF \{ 24, 36 \} = 12 = 2^2 \times 3$

Ans: B

04. $HCF \{ 45, 60 \} = 15 = 3 \times 5$

Ans: C

05. $HCF \{ 63, 84 \} = 21$

$$\begin{array}{r} 63 \overline{) 84} (1 \\ \underline{63} \\ 21 \\ 21 \overline{) 63} (3 \\ \underline{63} \\ 0 \end{array}$$

Ans: C

06. HCF $\{80, 120\} = 40$

(6)

$$\begin{array}{r} 80 \overline{) 120} (1 \\ \underline{80} \\ 40 \overline{) 80} (2 \\ \underline{80} \\ 0 \end{array}$$

Ans: —

07 LCM $\{14, 28\} = 28$

Ans: B

08 HCF (or) GCD

Ans: D

09 HCF $\{8, 12\} = 4$

Ans: D

10 Co-primes = HCF

Ans: B

11 LCM $\{2, 3\} = 6$

Ans: B

12 Infinite

Ans: C

13 $100 = 2^2 \times 5^2$

Ans: C

14 Their product

Ans: B

15 LCM \times HCF = product of A & B

Ans: A

16 Conceptual

Ans: B

17 Conceptual

Ans: B

18 LCM $\{72, 90, 120\} = 360$

Ans: B

JEEMAINS LEVEL

01.

02. H.C.F $\{20, 30\} = 10$

Ans: D

03. H.C.F $\{32, 24\} = 8$

Optim verification technique

Ans: B

$$04 \text{ HCF } \{ 56, 72 \} = 8 = 2^3$$

Ans: C (7)

$$05 \text{ HCF } \{ 84, 126 \} = 42 = 2 \times 3 \times 7$$

Ans: —

$$06 \quad 36 \overline{) 54} \begin{array}{l} 1 \\ 36 \\ \hline 18 \end{array}$$

$$18 \overline{) 36} \begin{array}{l} 2 \\ 36 \\ \hline 0 \end{array}$$

$$\therefore \text{HCF} \{ 36, 54 \} = 18$$

Ans: D

07 Option verification technique

option D: 23, 69

$$23 \overline{) 69} \begin{array}{l} 3 \\ 69 \\ \hline 0 \end{array}$$

$$\text{HCF} \{ 23, 69 \} = 23$$

Ans: D

08 Option verification technique

option B $\text{HCF} \{ 155, 217 \} = 31$

Ans: B

09. Option verification

option A: $\text{HCF} \{ 64, 72, 81 \} = 1$

option D $\text{HCF} \{ 56, 64, 98 \} = 2$

No option satisfies the given data

$$10 \cdot \text{HCF} \{ 29, 87 \} = 29$$

Ans: A, C

11.

12

$$13 \text{ LCM} \{ 16, 24, 40 \} = 240$$

$$240 \times 41 = 9840$$

Ans: B

$$14. \text{HCF} \{ 45, 135, 105 \} = 15$$

Ans: A

$$15. \text{LCM} \{ 20, 24, 36, 48 \} = 10080$$

Ans: C

$$16. \text{HCF} \{ 325, 225 \} = 0.25 \text{ mt}$$

Ans: A

$$17. 999987$$

Ans: C

$$18. 20 \text{ lit}, 30000 \text{ m.l} = 30 \text{ lit}$$

$$\text{HCF} \{ 20, 30 \} = 10 \text{ lit}$$

Ans: A

$$19. 171 - 3 = 168, 251 - 6 = 245$$

$$\text{HCF} \{ 168, 245 \} = 7$$

Ans: C

$$20. \text{LCM} \left\{ \frac{36}{225}, \frac{48}{150}, \frac{72}{65} \right\} = \frac{\text{LCM} \{ 36, 48, 72 \}}{\text{HCF} \{ 225, 150, 65 \}}$$

$$= \frac{144}{5}$$

Ans: C

ADVANCED LEVEL QUESTIONS

$$01. \text{HCF} \{ 324, 432 \} = 108$$

Ans: D

$$02. \text{LCM} \{ 56, 72 \} = 504$$

03. c) Conceptual (True)

d) Conceptual (True)

Ans: D

$$04. \begin{array}{r} 864 \overline{) 972} \\ \underline{864} \\ 108 \end{array}$$

$$\begin{array}{r} 108 \overline{) 864} \\ \underline{864} \\ 0000 \end{array}$$

$$\begin{array}{r} 108 \overline{) 1080} \\ \underline{1080} \\ 0000 \end{array}$$

$$\text{HCF} = 108$$

Ans: B, C



05 $HCF \left\{ \frac{5}{8}, \frac{3}{4}, \frac{7}{10} \right\} = \frac{HCF \{ 5, 3, 7 \}}{LCM \{ 8, 4, 10 \}} = \frac{1}{40}$ (9)

06. Assertion (A): Conceptual (True)

Reason (R): Conceptual (True)

Ans: A

07. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

08. Assertion: $HCF \{ 35, 49 \} = 7$ (True)

Reason: True

Ans: A

09. Assertion: Conceptual (True)

Reason: Conceptual (True)

Ans: A

10. Assertion: $HCF \{ 17, 22 \} = 1$ (True)

Reason: Conceptual (True)

Ans: A

09. statement I: Conceptual (True)

statement II: Given $a \times b = 4107$

$$HCF \{ a, b \} = 37.$$

Let $a = 111$, then $111 \times b = 4107 \Rightarrow b = 37.$

clearly $HCF \{ 111, 37 \} = 37$ (True) Ans: A

10. $L.C.M \{ 15, 20, 30 \} = 60$

Ans: D

11. $L.C.M \{ 15, 20, 30, 25 \} = 300.$

It increases the LCM.

Ans: A

12. $HCF \left\{ \frac{9}{10}, \frac{12}{25}, \frac{18}{35}, \frac{21}{40} \right\} = \frac{HCF \{ 9, 12, 18, 21 \}}{LCM \{ 10, 25, 35, 40 \}} = \frac{3}{1400}$

Ans: C

$$13. \text{HCF} \{ 36, 84 \} = 12$$

Ans: 12⁽¹⁰⁾

$$14. \text{LCM} \{ 20, 30, 40 \} = 600$$

Ans: 600

$$15. \text{HCF} \{ 90, 120 \} = 30$$

Ans: 30

$$16. \text{A) factors of } 18 = \{ 1, 2, 3, 6, 9, 18 \}$$

$$\text{factors of } 24 = \{ 1, 2, 3, 4, 6, 8, 12, 24 \}$$

$$\text{Common factors} = \{ 1, 2, 3, 6 \}$$

$$\text{B) HCF} \{ 55, 121 \} = 11$$

$$\text{C) LCM} \{ 12, 24 \} = 24$$

$$\text{D) factors of } 38 = \{ 1, 2, 19, 38 \}$$

$$\text{factors of } 57 = \{ 1, 3, 19, 57 \}$$

$$\text{Common factors} = \{ 1, 19 \}$$

Ans: (p, q), s, t, r

⇒ THE END ⇐