

Chapter: 3
મધિમાદાં ત્રાફ યોડડા
Playing with Numbers

Ex = 3.4, જાડિમામ 3.4

1. જેક સિધીમાં મધિમાદાં રા મ.મ.ર. જાડામ ગુરુત્તરકરે દિધી ત્રાફ યોડા રહે.
Find H.C.F. of the following numbers by Prime Factorisation

(i) 30, 42

$$\begin{array}{r|l} 2 & 30 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 2 & 42 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$30 = 2 \times 3 \times 5$$

$$42 = 2 \times 3 \times 7$$

માંદ્રા ગુરુત્તરકરે = 2, 3

Common factors =

$$\text{H.C.F. (મ.મ.ર.)} = 2 \times 3 = 6$$

(iii) 180, 192

$$\begin{array}{r|l} 2 & 180 \\ \hline 2 & 90 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 2 & 192 \\ \hline 2 & 96 \\ \hline 2 & 48 \\ \hline 2 & 24 \\ \hline 2 & 12 \\ \hline 2 & 6 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

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

$$192 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3$$

C.F. માંદ્રા ગુરુત્તરકરે = 2, 2, 3

$$\text{H.C.F.} = 2 \times 2 \times 3 = 12$$

(ii) 135, 225

$$\begin{array}{r|l} 3 & 135 \\ \hline 3 & 45 \\ \hline 3 & 15 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 3 & 225 \\ \hline 3 & 75 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$135 = 3 \times 3 \times 3 \times 5$$

$$225 = 3 \times 3 \times 5 \times 5$$

માંદ્રા ગુરુત્તરકરે (C.F.) = 3, 3, 5

$$\text{H.C.F. (મ.મ.ર.)} = 3 \times 3 \times 5 = 45$$

(iv) 49, 91, 175

$$\begin{array}{r|l} 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 7 & 91 \\ \hline 13 & 13 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 5 & 175 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$49 = 7 \times 7$$

$$91 = 7 \times 13$$

$$175 = 5 \times 5 \times 7$$

C.F. (માંદ્રા ગુરુત્તરકરે) = 7

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

મ.મ.ર.

(V) 144, 252, 630

$$\begin{array}{r|l}
 2 & 144 \\
 \hline
 2 & 72 \\
 \hline
 2 & 36 \\
 \hline
 2 & 18 \\
 \hline
 3 & 9 \\
 \hline
 3 & 3 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 252 \\
 \hline
 2 & 126 \\
 \hline
 3 & 63 \\
 \hline
 3 & 21 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 630 \\
 \hline
 3 & 315 \\
 \hline
 3 & 105 \\
 \hline
 5 & 35 \\
 \hline
 7 & 7 \\
 \hline
 & 1
 \end{array}$$

ਸਾਂਝੇ ਗੁਣਕ (C.F.) = 2, 3, 3

$$\begin{aligned}
 \text{H.C.F. ਅ.ਸ.ਫ.} &= 2 \times 3 \times 3 \\
 &= 18
 \end{aligned}$$

2. ਤਿੰਨ ਸੰਖਿਆਵਾਂ ਅੰਕਿਤਾਵਾਂ ਦਾ ਅ.ਸ.ਫ. (H.C.F.) ਫੰਡ ਦਿੱਤੀ ਗਈ ਧਰਾ ਹੈ।
 Find H.C.F. of the following numbers using division method:

(i) 170, 238

$$\begin{array}{r}
 170 \overline{) 238} \quad 1 \\
 \underline{170} \\
 68 \overline{) 170} \quad 2 \\
 \underline{136} \\
 34 \overline{) 68} \quad 2 \\
 \underline{68} \\
 \hline
 0
 \end{array}$$

Hence H.C.F. of 170, 238 = 34

$$170, 238 \text{ ਦਾ ਅ.ਸ.ਫ.} = 34$$

(ii) 54, 144

$$\begin{array}{r}
 54 \overline{) 144} \quad 2 \\
 \underline{108} \\
 36 \overline{) 54} \quad 1 \\
 \underline{36} \\
 18 \overline{) 36} \quad 2 \\
 \underline{36} \\
 \hline
 0
 \end{array}$$

Hence H.C.F. of 54, 144 = 2

$$54, 144 \text{ ਦਾ ਅ.ਸ.ਫ.} = 2$$

(iii) 72, 88

$$\begin{array}{r}
 72 \overline{) 88} \quad 1 \\
 \underline{72} \\
 16 \overline{) 72} \quad 4 \\
 \underline{64} \\
 8 \overline{) 16} \quad 2 \\
 \underline{16} \\
 \hline
 0
 \end{array}$$

H.C.F.

$$\text{ਅ.ਸ.ਫ.} = 8$$

(iv) 96, 240, 336

(3)

Consider any two numbers 240, 336
 ગાન કાઢે રી રી છે કિયા = 240, 336

$$\begin{array}{r} 240 \overline{) 336} \quad 1 \\ \underline{240} \\ 96 \overline{) 240} \quad 2 \\ \underline{192} \\ 48 \overline{) 96} \quad 2 \\ \underline{96} \\ \hline \end{array}$$

H.C.F of 240, 336 = 48, Now we will find out H.C.F of 48, 96
 240 અને 336 ના ગ.ગ.ક 48 છે, હવે અમે 48 અને 96 ના ગ.ગ.ક શોધી રહ્યા છીએ।

$$\begin{array}{r} 48 \overline{) 96} \quad 2 \\ \underline{96} \\ \hline \end{array}$$

H.C.F of 96, 240, 336 = 48

(v) 120, 156, 192

Consider any two numbers 156, 192
 ગાન કાઢે રી રી છે કિયા = 156, 192

$$\begin{array}{r} 156 \overline{) 192} \quad 1 \\ \underline{156} \\ 36 \overline{) 156} \quad 4 \\ \underline{144} \\ 12 \overline{) 36} \quad 3 \\ \underline{36} \\ \hline \end{array}$$

H.C.F of 192, 156 = 12
 Now we will find out H.C.F of 12, 120.
 હવે અમે 12 અને 120 ના ગ.ગ.ક શોધી રહ્યા છીએ।

$$\begin{array}{r} 12 \overline{) 120} \quad 10 \\ \underline{120} \\ \hline \end{array}$$

H.C.F of 120, 156, 192 = 12

120, 156, 192 ના ગ.ગ.ક = 12

(4)

③ ਦੋ ਅਭਾਜ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ ਕੀ ਹੋਵੇਗਾ?

What is H.C.F. of two prime numbers?

ਦੋ ਅਭਾਜ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ 1 ਹੋਵੇਗਾ

H.C.F. of two prime numbers = 1.

④ ਦੋ ਲਗਾਤਾਰ ਇਕੱਠੇ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ ਕੀ ਹੋਵੇਗਾ?

What is H.C.F. of two consecutive even numbers?

H.C.F. of two consecutive even numbers = 2

ਦੋ ਲਗਾਤਾਰ ਇਕੱਠੇ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ = 2

⑤ ਦੋ ਲਗਾਤਾਰ ਪ੍ਰਾਕ੍ਰਿਤ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ ਕੀ ਹੋਵੇਗਾ?

What is H.C.F. of two consecutive Natural Numbers?

H.C.F. of two consecutive natural numbers = 1

ਦੋ ਲਗਾਤਾਰ ਪ੍ਰਾਕ੍ਰਿਤ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ = 1

⑥ ਦੋ ਲਗਾਤਾਰ ਟਾਂਕ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ ਕੀ ਹੋਵੇਗਾ?

What is H.C.F. of two consecutive odd numbers?

H.C.F. of two consecutive odd numbers = 1

ਦੋ ਲਗਾਤਾਰ ਟਾਂਕ ਸੰਖਿਆਵਾਂ ਦਾ ਗ.ਮ.੨ = 1

⑦ ਉਹ ਵੱਡੀ ਤੋਂ ਵੱਡੀ ਸੰਖਿਆ ਪਤਾ ਕਰੋ ਜਿਸ ਨਾਲ 245 ਅਤੇ 1029 ਨੂੰ ਭਾਗ ਦੇਣ 'ਤੇ ਹਰੇਕ ਯਾਦ ਤੋਂ ਬਾਕੀ 5 ਬਚੇ।

Find the greatest number which divides 245 and 1029, leaving a remainder 5 in each case.

Required greatest Number = H.C.F. of $(245-5), (1029-5)$

ਘੋੜੀਂਦੀ ਸੰਖਿਆ

= H.C.F. of 240, 1024

$$\begin{array}{r|l}
 2 & 240 \\
 2 & 120 \\
 2 & 60 \\
 2 & 30 \\
 3 & 15 \\
 5 & 5 \\
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 1024 \\
 2 & 512 \\
 2 & 256 \\
 2 & 128 \\
 2 & 64 \\
 2 & 32 \\
 2 & 16 \\
 2 & 8 \\
 2 & 4 \\
 2 & 2 \\
 & 1
 \end{array}$$

(5)

Required greatest Number

$$= 2 \times 2 \times 2 \times 2 = 16$$

જોડકાં દેડા કે દેડા મળિયા = $2+2+2+2 = 16$

૮) જુ દેડા કે દેડા મળિયા પણ જે કિમ તાફ 782 અને 460 ને ગુણ
 હવે કે સમઠ 2 અને 5 દારી મે.

Find the greatest number that can divide 782 and 460 leaving remainder 2 and 5 respectively.

Required greatest Number
 જોડકાં મળિયા

$$\begin{aligned}
 &= \text{H.C.F.} (782-2), (460-5) \\
 &= \text{H.C.F.} 780, 455
 \end{aligned}$$

$$\begin{array}{r|l}
 2 & 780 \\
 2 & 390 \\
 3 & 195 \\
 5 & 65 \\
 13 & 13 \\
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 5 & 455 \\
 7 & 91 \\
 13 & 13 \\
 & 1
 \end{array}$$

$$\text{H.C.F.} = 5 \times 13 = 65$$

∴ Required greatest Number
 જોડકાં મળિયા = 65

9. જુ દેડા કે દેડા મળિયા પણ જે કિમ તાફ 398, 437 અને
 540 ને ગુણ હવે કે સમઠ 7, 12 અને 13 દારી

Find the greatest Number that will divide 398, 437 and 540 leaving remainders 7, 12 and 13 respectively.

Required greatest Number = $(398-7), (434-12), (540-13)$ 6
 $= 391, 425, 527$

$$\begin{array}{r|l} 17 & 391 \\ \hline 23 & 23 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 5 & 425 \\ \hline 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 17 & 527 \\ \hline 31 & 31 \\ \hline & 1 \end{array}$$

H.C.F $391, 425, 527 = 17$

फेरीरी मधिक

Required greatest Number = 17

10. दो दोष दोष घण्टाओं में खराब 529 लिटर में 667 लिटर हैं
 हैं। उन घण्टा की अधिकतम संख्या यहाँ से भी हिला है
 घण्टाओं में हैं हैं यहाँ यहाँ माथ में।

Two different Containers contain 529 litres and 667 litres of milk respectively. Find the maximum Capacity of Container which can measure the milk of both Containers in exact number of times.

We have to find maximum Capacity of Containers.

∴ We require maximum number which divides 529, 667 Completely.

∴ We will find H.C.F 529, 667

माँ, हँ, हँ (अधिकतम) मधिक लिटर 529, 667 हैं यहाँ यहाँ हँ फेरीरी हैं।

∴ ममी 529, 667 का म.म.ह यहाँ मंगो।

$$\begin{array}{r|l} 23 & 529 \\ \hline 23 & 23 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 23 & 667 \\ \hline 29 & 29 \\ \hline & 1 \end{array}$$

$529 = 23 \times 23$

$667 = 23 \times 29$

H.C.F = 23

∴ घण्टा की अधिकतम संख्या = 23 लिटर
 Maximum Capacity of Container = 23 litres

- ⑪ ਦਿੱਤੇ 136 ਸੇਬ, 170 ਆਂਧ ਅਤੇ 255 ਸੰਤਰੇ ਹਨ। ਇਹ ਫਲ ਫਿੱਥ ਫਿੱਥ ਤਰ੍ਹਾਂ ਘੋਰ ਕੀਤੇ ਬਾਂਦੇ ਹਨ ਜਿਸ ਤਰ੍ਹਾਂ ਫਿੱਥ ਫਿੱਥ ਫਿੱਥ ਫਿੱਥ ਦੀ ਗਿਣਤੀ ਬਰਾਬਰ ਹੈ। ਫਿੱਥ ਫਿੱਥ ਫਿੱਥ ਫਿੱਥ ਦੀ ਸੰਭਵ ਹੋਣੀ ਤੋਂ ਹੋਣੀ ਸੰਭਵ ਪਤਾ ਕਰੋ।

There are 136 apples, 170 mangoes and 255 oranges. These are to be packed in boxes containing the same number of fruits. Find the greatest number of fruits possible in each box.

ਫਲ ਫਿੱਥ ਫਿੱਥ ਦੀ ਸੰਭਵ ਹੋਣੀ ਤੋਂ ਹੋਣੀ ਸੰਭਵ
Greatest Number of fruits possible = H.C.F. of 136, 170, 255

$$\begin{array}{r|l} 2 & 136 \\ \hline 2 & 68 \\ \hline 2 & 34 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 2 & 170 \\ \hline 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 255 \\ \hline 5 & 85 \\ \hline 17 & 17 \\ \hline & 1 \end{array}$$

$$136 = 2 \times 2 \times 2 \times 17$$

$$170 = 2 \times 5 \times 17$$

$$255 = 3 \times 5 \times 17$$

$$\text{H.C.F.} = 17$$

∴ ਫਲ ਫਿੱਥ ਫਿੱਥ ਦੀ ਸੰਭਵ ਹੋਣੀ ਤੋਂ ਹੋਣੀ ਸੰਭਵ = 17

Greatest Number of fruits possible = 17

- ⑫ ਲੱਕੜ ਦੇ ਤਿੰਨ ਟੁਕੜੇ 54 ਮੀਟਰ, 36 ਮੀਟਰ ਅਤੇ 24 ਮੀਟਰ ਦੇ ਹਨ, ਜਿਨ੍ਹਾਂ ਨੂੰ ਬਰਾਬਰ ਲੰਬਾਈ ਦੇ ਟੁਕੜਿਆਂ (ਤਖਤਿਆਂ) ਵਿੱਚ ਵੰਡਿਆ (ਵੰਡਿਆ) ਜਾਵੇਗਾ। ਜੇ ਟੁਕੜੇ (ਤਖਤ) ਦੀ ਹੋਣੀ ਤੋਂ ਹੋਣੀ ਸੰਭਵ ਲੰਬਾਈ ਪਤਾ ਕਰੋ।

Three pieces of timber 54m, 36m and 24m long, have to be divided into planks of same length. What is the greatest possible length of each plank?

Greatest possible length of each plank = H.C.F. of 54, 36 and 24

ਜੇ ਟੁਕੜੇ ਦੀ ਹੋਣੀ ਤੋਂ ਹੋਣੀ ਸੰਭਵ ਲੰਬਾਈ = ਮ.ਮ.ਦ 54, 36, 24

$$\begin{array}{r|l} 2 & 54 \\ \hline 3 & 18 \\ \hline 3 & 6 \\ \hline 3 & 2 \\ \hline 1 & \end{array}$$

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

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

$$54 = 2 \times 3 \times 3 \times 3$$

$$36 = 2 \times 2 \times 3 \times 3$$

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

$$\text{H.C.F} = 2 \times 3$$

$$= 6 \text{ m}$$

જડ હોઈ શકે તે હોઈ કે હોઈ મંડર કંદાલ = 6 મીટર
Greatest possible length of each plank = 6 m.

- ⑬ દિંર રમ્મ 4.8 મીટર મડે 5.04 મીટર માથ શાકે. ઉમ
રમ્માર હોઈ કે હોઈ લાદિન શા માથ યકા શે ચિમકે ધિમ્કે રત
કમ્મ કે માદિમા શા મરશા કે

A room measures 4.8 m and 5.04 m. Find the size of largest square tile that can be used to tile the floor without cutting any tile.

$$1 \text{ m} = 100 \text{ cm}$$

$$\therefore 4.8 \text{ m} = \frac{48}{100} \times 100 = 480 \text{ cm}$$

$$5.04 \text{ m} = \frac{504}{100} \times 100 = 504 \text{ cm}$$

Size of largest square tile = H.C.F 480, 504

રમ્માર હોઈ કે હોઈ લાદિન શા માથ = મ.મ.ક 480, 504

$$\begin{array}{r} 480 \overline{) 504} \quad \text{L1} \\ \underline{480} \\ 24 \overline{) 480} \quad \text{L2} \\ \underline{480} \\ 0 \end{array}$$

Size of largest square tile = 24 cm

રમ્માર હોઈ કે હોઈ લાદિન શા માથ = 24 cm.

(14) ਹੇਠ ਲਿਖੀਆਂ ਹਰੇਕ ਭਿੰਨਾਂ ਨੂੰ ਆਪਣੇ ਸਿਉਨਤਮ ਰੂਪ ਵਿੱਚ ਲਿਖੋ: (9)

Reduce each of the following fractions to lowest form:

Sol: In order to reduce a given fraction to the lowest term, we divide the numerator and denominator by H.C.F.
 ਇਹ ਭਿੰਨ ਨੂੰ ਸਿਉਨਤਮ ਰੂਪ ਵਿੱਚ ਲਿਖਣ ਲਈ ਅਸੀਂ ਅਸੀਂ
 ਨੂੰ ਇਸਦੇ ਅ.ਮ.ਦ. ਨਾਲ ਭਾਗ ਦੇਵਾਂਗੇ।

(i) $\frac{85}{102}$

$$\begin{array}{r} 85 \overline{)102} 1 \\ \underline{85} \\ 17 \overline{)85} 5 \\ \underline{85} \\ \hline \end{array}$$

H.C.F. = 17
 ਅ.ਮ.ਦ.

$$\therefore \frac{85}{102} \div \frac{17}{17} = \frac{5}{6}$$

(ii) $\frac{52}{130}$

$$\begin{array}{r} 52 \overline{)130} 2 \\ \underline{104} \\ 26 \overline{)52} 2 \\ \underline{52} \\ \hline \end{array}$$

H.C.F. = 26
 ਅ.ਮ.ਦ.

$$\frac{52}{130} \div \frac{26}{26} = \frac{2}{5}$$

(iii) $\frac{289}{391}$

$$\begin{array}{r} 289 \overline{)391} 1 \\ \underline{289} \\ 102 \overline{)289} 2 \\ \underline{204} \\ 85 \overline{)102} 1 \\ \underline{85} \\ 17 \overline{)85} 5 \\ \underline{85} \\ \hline \end{array}$$

H.C.F. = 17

$$\frac{289}{391} \div \frac{17}{17} = \frac{17}{23}$$

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