**Chapter 4**

**Playing with numbers**

**Exercise 4.1**

**1. Multiple Choice Questions (MCQ)**

(i) A number, which is a factor of every number, is  
**(c) 1**

(ii) The first multiple of 4 is  
**(a) 4**

(iii) The common factor (except 1) of 112, 133 and 119 is  
**(d) 7**

**2. Find the factors of the following numbers:**

(i) 8 = **1, 2, 4, 8**  
(ii) 18 = **1, 2, 3, 6, 9, 18**  
(iii) 23 = **1, 23** *(Prime number)*  
(iv) 30 = **1, 2, 3, 5, 6, 10, 15, 30**  
(v) 48 = **1, 2, 3, 4, 6, 8, 12, 16, 24, 48**  
(vi) 324 = **1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 81, 108, 162, 324**  
(vii) 168 = **1, 2, 3, 4, 6, 7, 8, 12, 14, 21, 24, 28, 42, 56, 84, 168**  
(viii) 54 = **1, 2, 3, 6, 9, 18, 27, 54**

**3. Is 87 a factor of 1,748,352?**

**Check by dividing:**  
1,748,352 ÷ 87 = **20,104**  
**So, YES, 87 is a factor of 1,748,352.**

**4. Find the multiples of the following numbers:**

(*We'll give first five multiples for clarity.*)

(i) 5 = **5, 10, 15, 20, 25,30…..**  
(ii) 12 = **12, 24, 36, 48, 60**  
(iii) 6 = **6, 12, 18, 24, 30**  
(iv) 11 = **11, 22, 33, 44, 55**  
(v) 4 = **4, 8, 12, 16, 20**  
(vi) 16 = **16, 32, 48, 64, 80**

**5. Write down the first five multiples of the given numbers:**

(i) 6 = **6, 12, 18, 24, 30**  
(ii) 12 = **12, 24, 36, 48, 60**  
(iii) 3 = **3, 6, 9, 12, 15**  
(iv) 21 = **21, 42, 63, 84, 105**  
(v) 25 = **25, 50, 75, 100, 125**  
(vi) 13 = **13, 26, 39, 52, 65**

**6. Find:**

(i) The eighth multiple of 80 = **80 × 8 = 640**  
(ii) Multiples of 5 between 32 and 62 = **35, 40, 45, 50, 55, 60**

**Exercise 4.2**

**1. Multiple Choice Questions**

(i) The numbers which are not multiples of 2 are  
→ **(d) odd**

(ii) An example of twin primes is  
→ **(a) 11, 13**

(iii) Sum of two prime numbers is  
→ **(d) may be even or odd**

(iv) A prime number has at the most  
→ **(b) 2 factors**

(v) Factors of 15 are  
→ **(c) 1, 3, 5 and 15**

(vi) The three prime numbers greater than 100 are  
→ **(d) 101, 103 and 107**

(vii) Which of the following is an example of consecutive numbers?  
→ **(c) 10, 11, 12, 13**

**2. True or False**

(i) Two prime numbers are always co‑prime.  
→ **True**

(ii) Odd numbers always end in 1, 3, 4, 6, 9.  
→ **False** (they end in 1, 3, 5, 7, 9)

(iii) 9, 11, 13 and 15 are alternate numbers.  
→ **True** (they form a sequence with common difference 2)

(iv) All the odd numbers from 21 to 30 are 21, 23, 25, 27 and 29.  
→ **True**

(v) Sum of factors of 12 is 38.  
→ **False** (1+2+3+4+6+12 = 28)

(vi) All prime numbers except 2 are odd numbers.  
→ **True**

**3. Prime numbers in given ranges**  
(i) Between 10 and 19: 11, 13, 17, 19   
(ii) Between 16 and 27: 17, 19, 23

**4. Which are composite?**

* 39 – composite (divisible by 3)
* 47 – prime
* 57 – composite (3 × 19)
* 69 – composite (3 × 23)
* 83 – prime
* 93 – composite (3 × 31)
* 103 – prime

**5. Even or not?**  
(i) 9 – not even (odd)  
(ii) 16 – even

**6. Odd or not?**  
(i) 19 – (yes) odd   
(ii) 21 – (yes) odd

**7. Express as sum of twin primes**  
Twin primes are pairs of primes differing by 2.   
(i) 24 = 11 + 13  
(ii) 84 = 41 + 43

**8. Which pairs are co‑primes?**  
Two integers are co‑prime if their greatest common divisor is 1.

(i) 20, 25 – gcd = 5 → not co‑prime  
(ii) 18, 35 – gcd = 1 → co‑prime

**9. Express as sum of two odd primes**  
By Goldbach’s conjecture (verified for small even numbers).   
(i) 80 = 7 + 73   
(ii) 100 = 3 + 97

**10. Ten pairs of co‑prime numbers**  
Examples (gcd = 1 in each):  
(2, 3), (3, 4), (4, 9), (8, 15), (14, 15), (18, 35), (25, 49), (16, 27), (17, 20), (9, 28)

A **co-prime pair** (or **relatively prime** pair) is just two integers whose **greatest common divisor (gcd)** is **1**. It **does not** mean that each number in the pair has to be prime itself—only that they share **no prime factors** in common. **Definition:** gcd⁡(a,b)=1\gcd(a,b)=1gcd(a,b)=1 ⇒ aaa and bbb are co-prime. **Key point:** Either or both numbers can be composite, as long as they don’t share any factor >1. Examples : **(8, 15)** are co-prime even though 8=2³ and 15=3·5 (no overlap of prime factors). **(14, 15)** are co-prime (14=2·7, 15=3·5). **(4, 9)** are co-prime (4=2², 9=3²). **(17, 20)** are co-prime (17 is prime, 20=2²·5). Contrast with a non–co-prime pair like (6, 15): 6=2·3, 15=3·5 → gcd=3 → **not** co-prime. So you don’t need both numbers to be prime—just that their only common divisor is 1.

**11. Verify that 496 is a perfect number**  
Proper divisors of 496: 1, 2, 4, 8, 16, 31, 62, 124, 248  
Sum = 1+2+4+8+16+31+62+124+248 = 496

**12. Two consecutive composite numbers < 10 with no prime between them**  
8 and 9 (both composite; no integer lies between them)

**13. Other three‑digit “permutable” primes**  
A permutable prime remains prime under all digit permutations.   
Besides 199 (with 919, 991), the only other three‑digit sets are:

* {113, 131, 311}
* {337, 373, 733}

**Exercise 4.3 Solutions**

**1. Multiple‐Choice Questions**

**(i)** Which of the following numbers is divisible by 2?  
A number is divisible by 2 if its last digit is even (0, 2, 4, 6, 8).

* 250808 – ends in 8 → divisible
* 12711 – ends in 1 → not
* 39159 – ends in 9 → not
* 40953 – ends in 3 → not

**Answer:** (a) 250808

**(ii)** Which of the following numbers is divisible by 6?  
A number is divisible by 6 if and only if it is divisible by 2 **and** by 3.

* 5024 – even (÷2), sum 5+0+2+4=11 (not ÷3) → no
* 7125 – odd → no
* 301806 – even, sum 3+0+1+8+0+6=18 (÷3) → yes
* 7123 – odd → no

**Answer:** (c) 301806

**(iii)** Which of the following numbers is divisible by both 5 and 10?

* Divisible by 5 ⇔ last digit is 0 or 5.
* Divisible by 10 ⇔ last digit is 0.

Only those ending in 0 satisfy **both**.

* 1055 – ends 5 (÷5 only)
* 2305 – ends 5
* 3124 – ends 4
* 410000 – ends 0

**Answer:** (d) 410000

**2. Check divisibility by 4**

Rule: A number is divisible by 4 if its last two digits form a number divisible by 4.   
1. 583 668 → last two digits 68; 68÷4=17 → **yes**  
2. 986 219 → last two 19; 19÷4=4 R3 → **no**  
3. 1 403 731 → last two 31; 31÷4=7 R3 → **no**

**3. Check divisibility by 6**

Rule: Divisible by 6 ⇔ divisible by 2 and 3.   
1. 597 306 → even; sum 5+9+7+3+0+6=30 (÷3) → **yes**  
2. 186 203 → odd → **no**  
3. 836 526 → even; sum 8+3+6+5+2+6=30 (÷3) → **yes**

**4. Check divisibility by 9**

Rule: A number is divisible by 9 if the sum of its digits is divisible by 9.   
1. 109 818 → sum 1+0+9+8+1+8=27 (÷9) → **yes**  
2. 871 236 → sum 8+7+1+2+3+6=27 (÷9) → **yes**  
3. 257 064 → sum 2+5+7+0+6+4=24 (not ÷9) → **no**

**5. Check divisibility by 8**

Rule: A number is divisible by 8 if its last three digits form a number divisible by 8.   
1. 329 408 → last three 408; 408÷8=51 → **yes**  
2. 871 241 → last three 241; 241÷8=30 R1 → **no**  
3. 957 896 → last three 896; 896÷8=112 → **yes**

**6. Check divisibility by 11**

Rule: A number is divisible by 11 if the difference between the sum of its alternate digits is 0 or a multiple of 11.

* Write digits left → right, sum the 1ᵒ,3ᵒ,5ᵒ… and the 2ᵒ,4ᵒ,6ᵒ… separately.  
  1. 61 809 → (6+8+9)=23, (1+0)=1, 23−1=22 (÷11) → **yes**  
  2. 70 169 803 → (7+1+9+0)=17, (0+6+8+3)=17, 17−17=0 → **yes**  
  3. 3 178 965 → (3+7+9+5)=24, (1+8+6)=15, 24−15=9 (not ÷11) → **no**

**7. If a number is divisible by 6, it is always divisible by \_\_\_.**

Since 6=2×3, any multiple of 6 is also a multiple of 2 and of 3.   
**Answer:** 2 and 3

**8. Replace “\*” to make divisible by 9**

Rule: Sum of digits ≡ 0 (mod 9).   
1. 379*4 → 3+7+9+*+4 = 23+*. We need 23+* ≡ 0 (mod 9). 23≡5, so 5+\*≡0 ⇒ \* = 4.  
→ 37944  
2. *8768 → +8+7+6+8 = 29+. 29≡2, so 2+*≡0 ⇒ \* = 7.  
→ 78768

**Class 6 Maths Exercise 4.4**

## 1. H.C.F. by Prime Factorisation

**Rule:**

1. Write each number as a product of primes.
2. Identify the primes common to all numbers.
3. For each common prime, take the **lowest exponent** appearing.
4. H.C.F. = product of those primes raised to those exponents.

| **Group** | **Prime Factors** | **Common primes & exponents** | **H.C.F.** |
| --- | --- | --- | --- |
| **(i) 32, 48, 96** | 32 = 2⁵ 48 = 2⁴x3¹ 96 = 2⁵x3¹ | 2^min(5,4,5)=2⁴ | 2⁴ = 16 |
| **(ii) 144, 192, 216** | 144 = 2⁴x3² 192 = 2⁶x3¹ 216 = 2³x3³ | 2^min(4,6,3)=2³; 3^min(2,1,3)=3¹ | 2³x3¹ = 8x3 = 24 |
| **(iii) 65, 117, 273** | 65 = 5¹x13¹ 117 = 3²x13¹ 273 = 3¹x7¹x13¹ | 13^min(1,1,1)=13¹ | 13 |
| **(iv) 30, 60, 75** | 30 = 2¹x3¹x5¹ 60 = 2²x3¹x5¹ 75 = 3¹x5² | 3^min(1,1,1)=3¹;  5^min(1,1,2)=5¹ | 3x5 = 15 |
| **(v) 32, 36, 48** | 32 = 2⁵ 36 = 2²x3² 48 = 2⁴x3¹ | 2^min(5,2,4)=2² | 2² = 4 |

## 2. H.C.F. by Short Division

**Rule:**  
Divide all numbers simultaneously by a prime as long as all are divisible. Multiply those divisors to get the H.C.F.

| **Group** | **Division steps** | **H.C.F.** |
| --- | --- | --- |
| **(i) 38, 95, 171** | ÷19: (2, 5, 9) → no further common prime | 19 |
| **(ii) 72, 81, 99** | ÷3: (24, 27, 33) → ÷3: (8, 9, 11) → stop | 3x3 = 9 |
| **(iii) 60, 80, 90** | ÷2: (30,40,45) → ÷2: (15,20,45) stops → ÷5: (3,4,9) stops | 2x2x5 = 20? |
| But 20 does not divide 90. Correct is: ÷2→(30,40,45), ÷5→(6,8,9) stops. So H.C.F.=2·5=10. | 10 |  |
| **(iv) 84, 105, 168** | ÷3: (28,35,56) → ÷7: (4,5,8) stops | 3x7 = 21 |
| **(v) 70, 112, 196** | ÷2: (35,56,98) → ÷7: (5,8,14) stops | 2x7 = 14 |

## 3. H.C.F. by Short Division (More Groups)

| **Group** | **Steps** | **H.C.F.** |
| --- | --- | --- |
| **(i) 615, 984** | ÷3: (205, 328) → ÷41: (5, 8) → stop | 3x41 = 123 |
| **(ii) 680, 935** | ÷5: (136, 187) → ÷17: (8, 11) → stop | 5x17 = 85 |
| **(iii) 120, 192** | ÷2: (60, 96) → ÷2: (30, 48) → ÷2: (15, 24) → ÷3: (5, 8) → stop | 2x2x2x3 = 24 |
| **(iv) 180, 192, 336** | ÷2: (90,96,168) → ÷2: (45,48,84) → ÷3: (15,16,28) → stop | 2x2x3 = 12 |
| **(v) 240, 432, 576, 864** | ÷2×4 times: (15,27,36,54) → ÷3: (5,9,12,18) → stop | 2⁴x3 = 16x3 = 48 |

## 4. L.C.M. by Prime Factorisation

**Rule:**

1. Prime‑factorise each.
2. For each prime that appears anywhere, take the **highest exponent** among the numbers.
3. Multiply these together.

| **Group** | **Prime Factors** | **Highest exponents** | **L.C.M.** |
| --- | --- | --- | --- |
| **(i) 4, 8, 16** | 4 = 2²; 8 = 2³; 16 = 2⁴ | 2⁴ | 16 |
| **(ii) 6,12,18** | 6 = 2¹x3¹; 12 = 2²x3¹; 18 = 2¹x3² | 2²·3² | 4x9 = 36 |
| **(iii) 12,16,20** | 12 = 2²x3¹; 16 = 2⁴; 20 = 2²x5¹ | 2⁴·3¹·5¹ | 16x3x5 = 240 |
| **(iv) 24,36** | 24 = 2³·3¹; 36 = 2²·3² | 2³·3² | 8x9 = 72 |
| **(v) 12,15** | 12 = 2²·3¹; 15 = 3¹·5¹ | 2²·3¹·5¹ | 4x3x5 = 60 |
| **(vi) 3,4,5** | 3 = 3¹; 4 = 2²; 5 = 5¹ | 2²·3¹·5¹ | 4x3x5 = 60 |

## 5. Find L.C.M. (Direct)

1. **21, 24**
   * 21 = 3x7; 24 = 2³x3 → L.C.M. = 2³x3x7 = 8x21 = 168
2. **16, 32**
   * 16 = 2⁴; 32 = 2⁵ → L.C.M. = 2⁵ = 32
3. **55, 88, 110**
   * 55 = 5x11; 88 = 2³x11; 110 = 2x5x11 → L.C.M. = 2³x5x11 = 8x55 = 440
4. **68, 102, 119**
   * 68 = 2²x17; 102 = 2x3x17; 119 = 7x17 → L.C.M. = 2²x3x7x17 = 4x3x7x17 = 12x119 = 1 428
5. **192, 188, 576**
   * 192 = 2⁶x3; 188 = 2²x47; 576 = 2⁶x3² → L.C.M. = 2⁶x3²x47 = 64x9x47 = 576x47 = 27 072

**Exercise 4.5**

### ****1. The product of two numbers is 2286. If their HCF is 9, find their LCM.****

We know:  
**Product of two numbers = HCF × LCM**

So,  
LCM = 2286 ÷ 9 = **254**

### ****2. The product of two numbers is 4120. If their LCM is 824, find their HCF.****

HCF = 4120 ÷ 824 = **5**

### ****3. HCF of 186 and 496 is 62. What is their LCM?****

Product = 186 × 496 = 92256  
LCM = 92256 ÷ 62 = **1488**

### ****4. HCF and LCM of two numbers are 25 and 5525. One number = 325. Find the other.****

Product of numbers = HCF × LCM = 25 × 5525 = 138125  
Other number = 138125 ÷ 325 = **425**

## ****PROBLEM SOLVING****

### ****5. Find the greatest number that will exactly divide 1065 and 1491.****

Find HCF of 1065 and 1491 using Euclidean method:  
1491 - 1065 = 426  
1065 - 426 = 639  
639 - 426 = 213  
426 - 213 = 213  
213 ÷ 213 = 1 → HCF = **213**

### ****6. Find the least number which after being increased by 2 is exactly divisible by 8, 16, and 24.****

LCM of 8, 16, and 24 = **48**  
Required number = 48 − 2 = **46**

## ****CRITICAL THINKING****

### ****7. Find the greatest number that can divide 166 and 237 leaving remainders 5 and 7 respectively.****

Let the required number be **x**.  
So,  
x divides (166 − 5) = 161 and (237 − 7) = 230  
Find HCF of 161 and 230:

* 230 − 161 = 69
* 161 − 69 = 92
* 92 − 69 = 23
* 69 − 46 = 23 → HCF = **23**

### ****8. Find the least number which, when increased by 3, is divisible by 36, 40 and 64.****

LCM of 36, 40, 64 =

* 36 = 2² × 3²
* 40 = 2³ × 5
* 64 = 2⁶
* LCM = 2⁶ × 3² × 5 = **5760**  
  Required number = 5760 − 3 = **5757**

### ****9. Find the greatest 4-digit number which is exactly divisible by 55, 88, and 110.****

LCM of 55, 88, and 110:

* Prime factors:
  + 55 = 5 × 11
  + 88 = 2³ × 11
  + 110 = 2 × 5 × 11
* LCM = 2³ × 5 × 11 = **440**  
  Now, greatest 4-digit number = 9999  
  9999 ÷ 440 = 22.72 → Closest lower whole number = 22  
  22 × 440 = **9680**

### ****10. Find the minimum length of a rope which can be cut into whole number of pieces of lengths 36 cm, 48 cm and 60 cm.****

This is asking for **LCM of 36, 48, 60**

* 36 = 2² × 3²
* 48 = 2⁴ × 3
* 60 = 2² × 3 × 5
* LCM = 2⁴ × 3² × 5 = **720 cm**

**MISCELLANEOUS EXERCISE**:

### ****1. (a) Divisibility by 4****

Rule: A number is divisible by 4 if its **last two digits** form a number divisible by 4.

* (iii) 39996 → last two digits = **96** → 96 ÷ 4 = 24 → **Yes**
* (ii) 794123 → last two digits = **23** → 23 ÷ 4 ≠ whole number → **No**

### ****(b) Divisibility by 6****

Rule: A number divisible by both **2 and 3** is divisible by 6.

* (iii) 399996 → ends in 6 (even), and digit sum = 3+9+9+9+9+6 = 45 → divisible by 3 → **Yes**
* (i) 755376 → ends in 6 (even), digit sum = 33 → divisible by 3 → **Yes**
* (ii) 537516 → ends in 6 (even), digit sum = 27 → divisible by 3 → **Yes**

### ****(c) Divisibility by 8****

Rule: Last **3 digits** must form a number divisible by 8.

* (iii) 1165056 → last 3 = **056** = 56 ÷ 8 = 7 → **Yes**
* (i) 4660222 → last 3 = **222** ÷ 8 = 27.75 → **No**
* (ii) 9320448 → last 3 = **448** ÷ 8 = 56 → **Yes**
* (iv) 771348 → last 3 = **348** ÷ 8 = 43.5 → **No**
* (v) 740702 → last 3 = **702** ÷ 8 = 87.75 → **No**

### ****(d) Divisibility by 9****

Rule: If **sum of digits** is divisible by 9, the number is divisible by 9.

* (i) 12345678 → sum = 36 → **Yes**
* (ii) 9876543 → sum = 42 → **No**
* (iii) 273645 → sum = 27 → **Yes**
* (iv) 19283742 → sum = 36 → **Yes**

### ****(e) Divisibility by 11****

Rule: Alternate digit sum difference is divisible by 11.

* (i) 1358016 → (1+5+0+1)=7; (3+8+0)=11 → |11 - 7| = 4 → **No**
* (ii) 6108531 → (6+0+5+1)=12; (1+8+3)=12 → |12 - 12| = 0 → **Yes**
* (iii) 555321 → (5+5+2)=12; (5+3+1)=9 → |12 - 9| = 3 → **No**
* (iv) 1086415 → (1+8+4+5)=18; (0+6+1)=7 → |18 - 7| = 11 → **Yes**

### ****(f) Which are prime numbers?****

Prime numbers are only divisible by 1 and itself.

* 139 → Prime
* 193 → Prime
* 373 → Prime
* 163 → Prime
* 187 = 11 × 17 → **Not Prime**
* 327 = 3 × 109 → **Not Prime**

**Primes: 139, 193, 373, 163**

### ****2. HCF using Prime Factorisation****

#### (i) 14, 28, 105

* 14 = 2 × 7
* 28 = 2² × 7
* 105 = 3 × 5 × 7  
  **Common = 7** → **HCF = 7**

#### (ii) 375, 825

* 375 = 3 × 5³
* 825 = 3 × 5² × 11  
  **Common = 3 × 5² = 75**

#### (iii) 375, 250

* 375 = 3 × 5³
* 250 = 2 × 5³  
  **Common = 5³ = 125**

### ****3. HCF using Short Division****

(Please upload numbers you want solved here.)

### ****4. HCF using Long Division Method****

#### (i) 490, 735

735 ÷ 490 = 1, remainder 245  
490 ÷ 245 = 2, remainder 0 → **HCF = 245**

#### (ii) 360, 456

456 ÷ 360 = 1, rem 96  
360 ÷ 96 = 3 rem 72  
96 ÷ 72 = 1 rem 24  
72 ÷ 24 = 3 rem 0 → **HCF = 24**

#### (iii) 168, 420

420 ÷ 168 = 2 rem 84  
168 ÷ 84 = 2 rem 0 → **HCF = 84**

#### (iv) 18, 27, 45, 99

HCF(18,27) = 9  
HCF(9,45) = 9  
HCF(9,99) = 9 → **HCF = 9**

#### (v) 66, 102, 138

HCF(66,102) = 6  
HCF(6,138) = 6 → **HCF = 6**

### ****5. LCM****

#### (i) 40, 60, 72, 96

LCM = 2⁵ × 3² × 5 = **1440**

#### (ii) 108, 135, 162

LCM = 2² × 3³ × 5 × 3 = **540**

#### (iii) 60, 75, 80, 50

LCM = 2⁴ × 3 × 5² = **1200**

### ****6. HCF and LCM****

#### (i) 54, 90

* HCF = 18
* LCM = (54×90)/18 = **270**

#### (iv) 21, 28, 105, 36

Prime factorizations:

* 21 = 3×7
* 28 = 2²×7
* 105 = 3×5×7
* 36 = 2²×3²  
  Common = None → **HCF = 1**

LCM = 2² × 3² × 5 × 7 = **1260**

### ****EXPERIENTIAL LEARNING****

#### (ii) 168, 392

* 168 = 2³ × 3 × 7
* 392 = 2³ × 7²  
  **HCF = 2³ × 7 = 56**  
  **LCM = 2³ × 3 × 7² = 1176**

### ****7. HCF = 9, LCM = 54, one number = 27. Find the other.****

Product = HCF × LCM = 9 × 54 = 486  
Other number = 486 ÷ 27 = **18**

### ****8. Product = 8064, HCF = 12. Find LCM.****

LCM = 8064 ÷ 12 = **672**

### ****9. Find smallest number divisible by 42, 56, 105****

LCM(42, 56, 105) =  
42 = 2 × 3 × 7  
56 = 2³ × 7  
105 = 3 × 5 × 7  
LCM = 2³ × 3 × 5 × 7 = **840**

### ****10. Least number which leaves remainder 7 when divided by 15, 21, 35, 42****

Let number = x  
Then (x − 7) divisible by 15, 21, 35, 42  
LCM = 2 × 3 × 5 × 7 = **210**  
So, number = 210 + 7 = **217**

### ****11. Greatest 4-digit number divisible by 8, 12, 15, 20****

LCM = 2³ × 3 × 5 = 120  
Largest 4-digit number = 9999  
9999 ÷ 120 = 83.325 → 83 × 120 = **9960**

**Chapter test 4**

**1.** First five multiples of 6:  
**6, 12, 18, 24, 30**

**2.** H.C.F. of 9, 15, 18 and 20 using **prime factorisation**:

* 9 = 3 × 3
* 15 = 3 × 5
* 18 = 2 × 3 × 3
* 20 = 2 × 2 × 5

**Common prime factor = none (except 1)**  
So, **H.C.F. = 1**

**3.** H.C.F. of 168 and 392 using **long division**:

* 392 ÷ 168 = 2 (remainder 56)
* 168 ÷ 56 = 3 (remainder 0)

So, **H.C.F. = 56**

**4.** L.C.M. of 48, 60, 72 and 96:

Prime factorizations:

* 48 = 2⁴ × 3
* 60 = 2² × 3 × 5
* 72 = 2³ × 3²
* 96 = 2⁵ × 3

Take highest powers:  
**L.C.M. = 2⁵ × 3² × 5 = 720**

**5.** Smallest number divisible by 32, 36 and 48 = **L.C.M.**

Prime factorizations:

* 32 = 2⁵
* 36 = 2² × 3²
* 48 = 2⁴ × 3

**L.C.M. = 2⁵ × 3² = 288**

**6.** H.C.F. = 9, L.C.M. = 270, one number = 54  
Use:  
**HCF × LCM = Product of two numbers**  
9 × 270 = 2430  
2430 ÷ 54 = **45**

**Other number = 45**

**7.** Least number which when increased by 7 is divisible by 12, 15, and 18  
Find L.C.M. of 12, 15, 18 =  
12 = 2² × 3, 15 = 3 × 5, 18 = 2 × 3²  
**L.C.M. = 2² × 3² × 5 = 180**

Answer: **180 - 7 = 173**

**8.** Find largest number that divides  
398 - 7 = 391,  
436 - 11 = 425,  
542 - 15 = 527

Now find H.C.F. of 391, 425, and 527:

* H.C.F.(391, 425) = 17
* H.C.F.(17, 527) = 17

**Answer: 17**

**9.** Courtyard:  
Length = 20 m 16 cm = **2016 cm**  
Breadth = 15 m 60 cm = **1560 cm**

Find H.C.F. of 2016 and 1560:  
**H.C.F. = 24 cm (side of square stone)**

Number of stones = (2016 × 1560) ÷ (24 × 24) =  
= 3141600 ÷ 576 = **5450**

**Answer: 5450 stones**

**10.** H.C.F. of any two consecutive numbers is **1**.