

GCSE Maths: Highest common factor and lowest common multiple (Higher): answers

GCSE Maths - Factors, Multiples and Primes - Higher - Lesson 2.4

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch02-factors-multiples-primes-powers/higher/highest-common-factor-and-lowest-common-multiple/

Exercise 2D HCF and LCM Non-calculator

1 Find the HCF of each pair of numbers by listing their factors.

(a) 12 and 18

Answer: 6

(b) 8 and 20

Answer: 4

(c) 15 and 25

Answer: 5

(d) 16 and 40

Answer: 8

(e) 14 and 21

Answer: 7

(f) 24 and 36

Answer: 12

2 Find the LCM of each pair of numbers by listing their multiples.

(a) 3 and 4

Answer: 12

(b) 6 and 8

Answer: 24

(c) 10 and 15

Answer: 30

(d) 4 and 18

Answer: 36

(e) 9 and 12

Answer: 36

(f) 5 and 7

Answer: 35

3 Write each number as a product of primes, then use a Venn diagram to find the HCF and LCM.

(a) 18 and 24

Answer: HCF = 6, LCM = 72

(b) 30 and 42

Answer: HCF = 6, LCM = 210

(c) 36 and 48

Answer: HCF = 12, LCM = 144

(d) 40 and 56

Answer: HCF = 8, LCM = 280

(e) 45 and 75

Answer: HCF = 15, LCM = 225

(f) 60 and 90

Answer: HCF = 30, LCM = 180

4 Find the HCF and LCM of each pair of numbers.

(a) 84 and 126

Answer: HCF = 42, LCM = 252

(b) 72 and 108

Answer: HCF = 36, LCM = 216

(c) 120 and 150

Answer: HCF = 30, LCM = 600

(d) 168 and 252

Answer: HCF = 84, LCM = 504

5 Two buses leave a depot together at 8:00 am. One leaves every 15 minutes and the other every 20 minutes. At what time do they next leave together?

Answer: 9:00 am

6 A ribbon 84 cm long and a ribbon 126 cm long are cut into equal pieces with no ribbon left over. All the pieces must be the same length. What is the greatest possible length of each piece?

Answer: 42 cm

7 Pencils come in packs of 12. Rubbers come in packs of 15. Ravi wants to buy the same number of pencils as rubbers. What is the smallest number of each pack he must buy?

Answer: 5 packs of pencils and 4 packs of rubbers (60 of each)

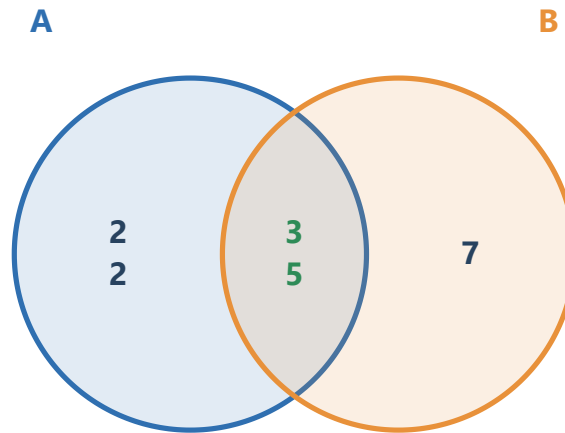
8 Two lighthouses flash together at 8:00 pm. One flashes every 20 seconds and the other every 30 seconds. How many more times in the next 5 minutes do they flash together?

Answer: 5

- 9 A baker has 48 chocolate biscuits and 72 oat biscuits. She makes identical bags, using all the biscuits. Each bag has the same number of chocolate biscuits and the same number of oat biscuits. What is the greatest number of bags she can make, and how many of each biscuit are in a bag?

Answer: 24 bags; 2 chocolate and 3 oat in each

- 10 The Venn diagram shows the prime factors of two numbers, A and B .



- (a) Work out A .

Answer: 60

- (b) Work out B .

Answer: 105

- (c) Work out the HCF of A and B .

Answer: 15

- (d) Work out the LCM of A and B .

Answer: 420

- 11 Sara says: "The LCM of two numbers is always bigger than both of them." Is she correct? Give an example to explain.

Answer: No. The LCM of 4 and 8 is 8, which is equal to the larger number.

- 12 (a) Find the HCF of 8 and 15. (b) Find the LCM of 8 and 15. (c) What do you notice about the LCM and 8×15 ?

- (a) (a)

Answer: 1

- (b) (b)

Answer: 120

- (c) (c)

Answer: The LCM equals $8 \times 15 = 120$. This happens when the HCF is 1.

- 13 Find the HCF and LCM of each set of three numbers.

(a) 12, 18, 30

Answer: $\text{HCF} = 2 \times 3$, $\text{LCM} = 2^2 \times 3^2 \times 5$

(b) 24, 36, 60

Answer: $\text{HCF} = 2^2 \times 3$, $\text{LCM} = 2^3 \times 3^2 \times 5$

(c) 20, 30, 45

Answer: $\text{HCF} = 5$, $\text{LCM} = 2^2 \times 3^2 \times 5$

(d) 16, 24, 40

Answer: $\text{HCF} = 2^3$, $\text{LCM} = 2^4 \times 3 \times 5$

14 Write down the HCF and LCM of A and B as products of prime factors. Then work out their values.

(a) $A = 2^3 \times 3 \times 5^2$, $B = 2^2 \times 3^2 \times 7$

Answer: $\text{HCF} = 2^2 \times 3 = 12$, $\text{LCM} = 2^3 \times 3^2 \times 5^2 \times 7 = 12,600$

(b) $A = 2^4 \times 3^2$, $B = 2 \times 3^3 \times 5$

Answer: $\text{HCF} = 2 \times 3^2 = 18$, $\text{LCM} = 2^4 \times 3^3 \times 5 = 2160$

(c) $A = 2^2 \times 5^2 \times 7$, $B = 2^3 \times 5 \times 11$

Answer: $\text{HCF} = 2^2 \times 5 = 20$, $\text{LCM} = 2^3 \times 5^2 \times 7 \times 11 = 15,400$

15 Find the number x in each part. Use $\text{HCF} \times \text{LCM} = \text{the product of the two numbers}$.

(a) The HCF of x and 18 is 6 and the LCM is 90.

Answer: 30

(b) The HCF of x and 28 is 4 and the LCM is 84.

Answer: 12

(c) The HCF of x and 30 is 5 and the LCM is 150.

Answer: 25

16 $a = 2^3 \times 3$ and $b = 2 \times 3^2 \times 5$. Show that $\text{HCF} \times \text{LCM} = a \times b$.

Answer: Both are $2^4 \times 3^3 \times 5 = 2160$

17 Alice visits the library every 6 days, Ben every 8 days and Cara every 9 days. All three are there on Monday 1 May. After how many days will they next all be there together?

Answer: 72 days

18 Two different whole numbers are both between 10 and 40. Their HCF is 5 and their LCM is 60. Find the two numbers.

Answer: 15 and 20