Use a Venn diagram to calculate the HCF and LCM

H

1 Choose a word to complete each sentence.

circles | multiplying | adding | intersection

The common factors are written in the intersection of a Venn diagram.

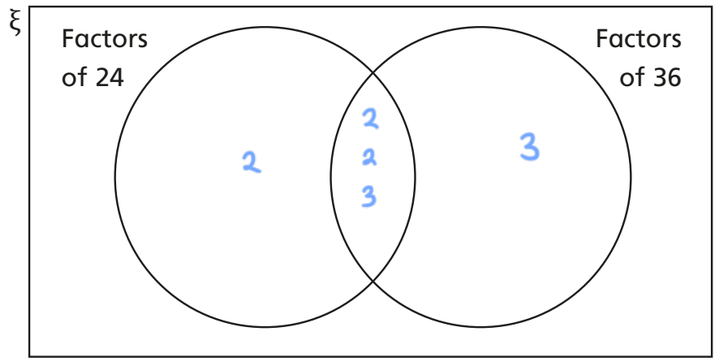
The highest common factor comes from multiplying the common factors together.

2 24 = 2 × 2 × 2 × 3 36 = 2 × 2 × 3 × 3

a) What are the common prime factors of 24 and 36? 2, 2, 3

b) Write the common factors of 24 and 36 in the Venn diagram.

Write the remaining factors in the Venn diagram.



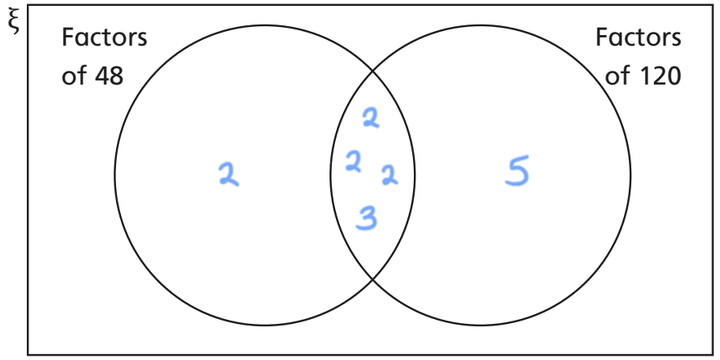
c) Use the Venn diagram to find the HCF and LCM of 24 and 36

HCF = 2×2×3 = 12

LCM = 2×2×2×3×3 = 72

3 Complete the Venn diagram to find the HCF and LCM of 48 and 120

48 = 2 × 2 × 2 × 2 × 3 120 = 2 × 2 × 2 × 3 × 5



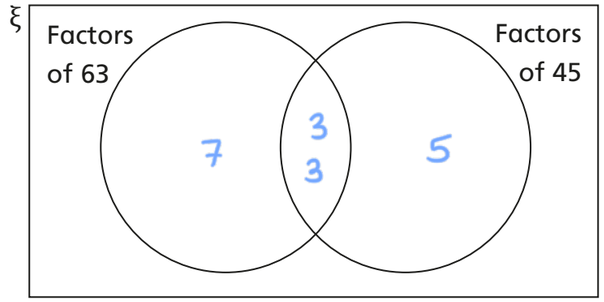
HCF = 2×2×2×3 = 24

LCM = 2×2×2×2×3×5 = 240

4 **a)** Write 63 and 45 as products of their prime factors.

63 = 3×3×7 45 = 3×3×5

b) Use a Venn diagram to find the HCF and LCM of 63 and 45



HCF = 3×3 = 9

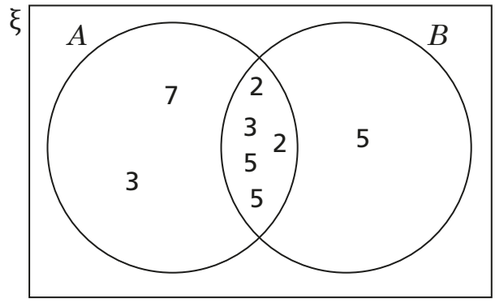
LCM = 7×3×3×5 = 315

c) Use your answers to work out the HCF of 63 and 90

Explain how you worked it out.

9

5 The Venn diagram shows the factors of two numbers. A and B.



a) Is 6 a factor of both numbers? Yes

Explain how you know.

2 and 3 are both in the intersection and 2×3=6

b) 14 is a factor of A but not of B.

Explain why this statement is true.

14 = 2×7 7 is only a factor of A, not B.

c) Write three more common factors of A and B.

e.g. 25 | 10 | 15

d) What is the HCF of A and B?

300

e) What is the LCM of A and B?

31,500

f) Is A greater than B? Yes

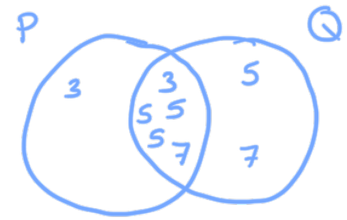
Show how you worked it out.

3×7 > 5

6 $P = 3^2 \times 5^3 \times 7$ $Q = 3 \times 5^4 \times 7^2$

What is the HCF and LCM of P and Q?

Draw a Venn diagram to help you.



HCF = $3 \times 5^3 \times 7$ = 2,625

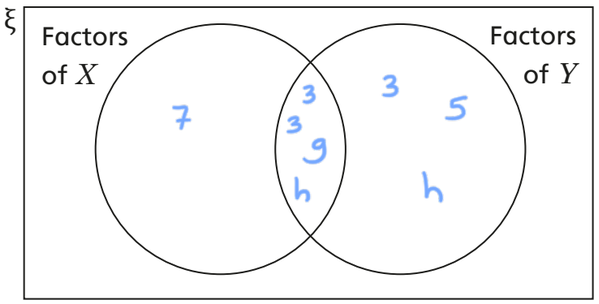
LCM = $3^2 \times 5^4 \times 7^2$ = 275,625

7 g and h are prime numbers.

$X = 3^2 \times 7 \times g \times h$ $Y = 3^3 \times 5 \times g \times h \times h$

Find the HCF and LCM of X and Y.

Use the Venn diagram to help you.



HCF = $3^2 \times g \times h$ = $9gh$

LCM = $3^3 \times 5 \times 7 \times g \times h^2$ = $945gh^2$