White Rose Maths

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.
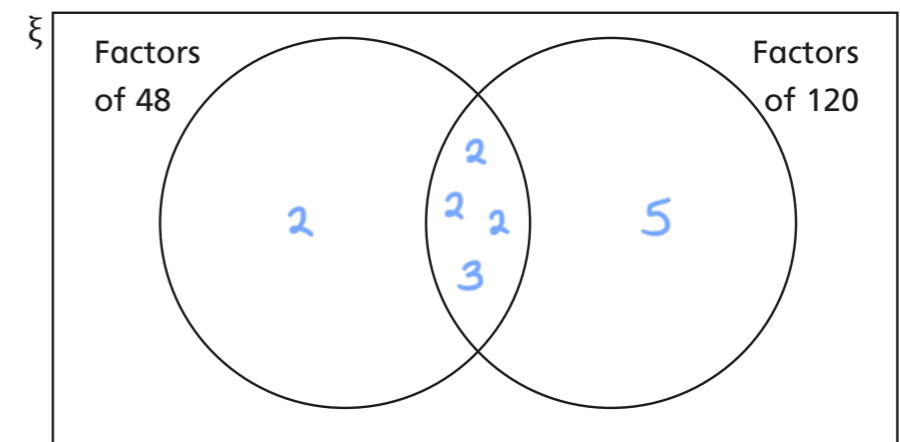
Write the remaining factors in the Venn diagram.

ξ Factors of 24   Factors of 36
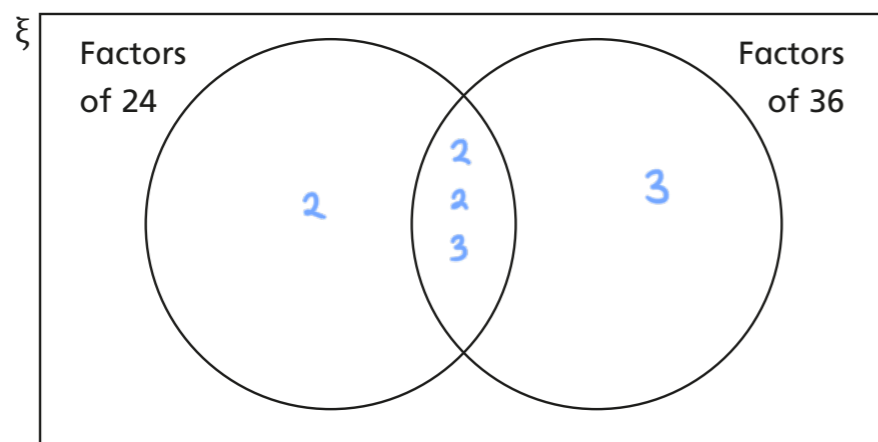
2   2 2 3   3

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 |

ξ Factors of 48   Factors of 120

2   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

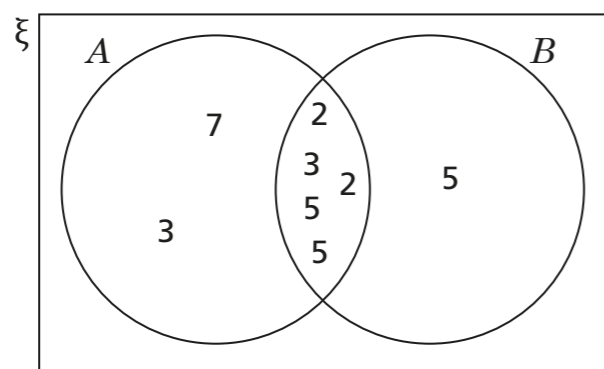ξ Factors of 63   Factors of 45
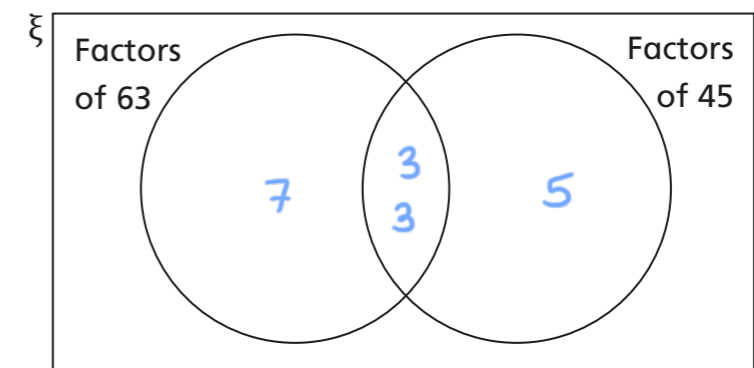
7   3 3   5

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 |

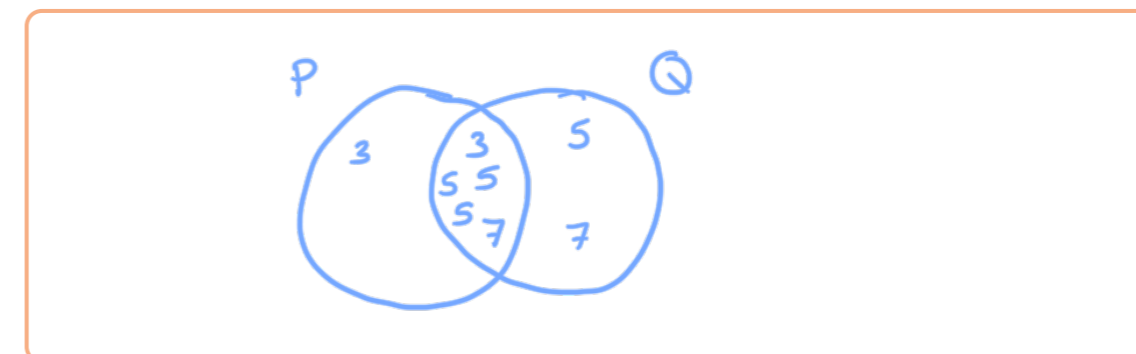f) Is A greater than B? _yes_

Show how you worked it out.

_3×7 > 5_

6

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

What is the HCF and LCM of P and Q?

Draw a Venn diagram to help you.

HCF = $\underline{3 \times 5^3 \times 7}$ = | 2,625 |

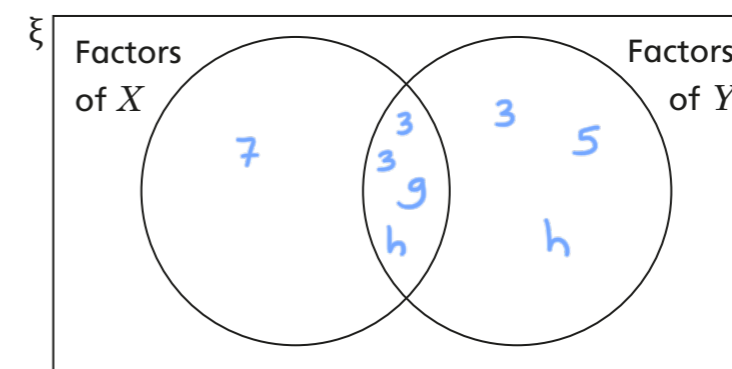LCM = $\underline{3^2 \times 5^4 \times 7^2}$ = | 275,625 |

7

g and h are prime numbers.

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

Find the HCF and LCM of X and Y.

Use the Venn diagram to help you.

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

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