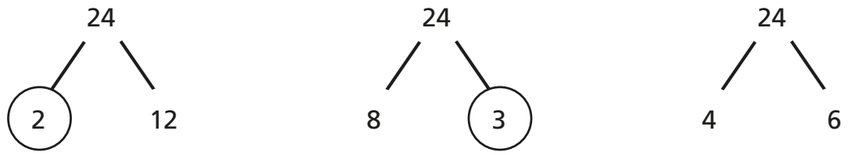
Write a number as a product of its prime factors

1 **a)** Complete the factor trees for the number 24

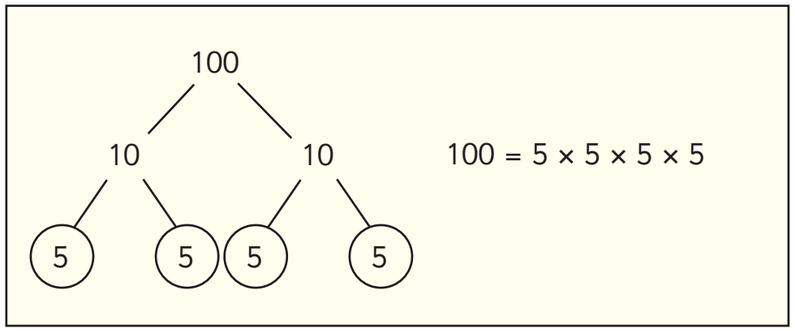


b) What is 24, as a product of its prime factors?

24 = ☐ × ☐ × ☐ × ☐

c) Discuss with a partner what you notice about your factor trees in part a).

2 Scott completes a factor tree for the number 100

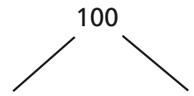


a) What mistake has he made?

_____

_____

b) Correct Scott's mistake.



100 = ☐ × ☐ × ☐ × ☐

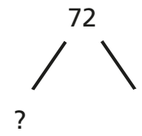
3 Complete a factor tree for each number.

Write each number as a product of its prime factors.

a) 80 **b)** 68

80 = _____ 68 = _____

4 **a)** What number could replace the question mark in the factor tree?



☐

b) Discuss your answer with a partner.

Is there more than one solution?

c) Write 72 as a product of its prime factors.

72 = _____

5 Write the numbers as products of their prime factors.

a) 9 = _____

18 = _____

36 = _____

81 = _____

b) 8 = _____

32 = _____

64 = _____

128 = _____

What do you notice about your answers?

6 Four numbers have been written on cards as the product of their prime factors.

2 × 3 × 3 × 5	2 × 2 × 2 × 3 × 5	2 × 3 × 5 × 5	2 × 2 × 3 × 5

The greatest number is the second card, as that has the most prime factors.

a) Do you agree with Whitney? _____

Explain your answer.

_____

_____

b) Write the numbers in ascending order.

_____

7 Dani works out 450 = 2 × 3 × 3 × 5 × 5

Use this information to write these numbers as a product of their prime factors.

900 = _____ 225 = _____

4,500 = _____ 150 = _____

8 A number has been written as the product of its prime factors.

The answer is $2^2 \times 3 \times 11^2$

Is 66 a factor of this number? _____

Explain how you know.

9 **a)**

f and g are prime numbers.
$5fg = 275$ and $g > f$

What is the value of g?

$g =$ ☐

b)

$192 = 2^a b$
a and b are prime numbers.

Find the values of a and b.

$a =$ ☐ $b =$ ☐

c)

495 can be written as c^2de.

What are the values of c, d and e?

$c =$ ☐ $d =$ ☐ $e =$ ☐

10

$A = 5^2 \times 7^2 \times 11^3 \times 13$

$B = 5^2 \times 7^3 \times 11^3 \times 13$

How many times greater is B than A? _____

Explain how you know.

_____

_____