

GCSE Maths: Prime factorisation (Higher): worksheet

GCSE Maths - Factors, Multiples and Primes - Higher - Lesson 2.3

Name: _____

Date: _____

Score: _____

15 questions. Write your answers in the spaces. Answers and step-by-step help are free at websink.site/gcse/maths/ch02-factors-multiples-primes-powers/higher/prime-factorisation/

Exercise 2C Prime factorisation

Non-calculator

- 1** Use a factor tree or a division ladder to write each number as a product of prime factors. Give your answers in index form.

(a) 12

Answer: _____

(b) 20

Answer: _____

(c) 28

Answer: _____

(d) 45

Answer: _____

(e) 50

Answer: _____

(f) 63

Answer: _____

- 2** Write each number as a product of prime factors, in index form.

(a) 72

Answer: _____

(b) 90

Answer: _____

(c) 120

Answer: _____

(d) 150

Answer: _____

(e) 180

Answer: _____

(f) 200

Answer: _____

- 3** Write each number as a product of prime factors, in index form.

(a) 360

Answer:

(b) 504

Answer:

(c) 630

Answer:

(d) 1000

Answer:

(e) 1800

Answer:

(f) 2310

Answer:

4 Work out the value of each number.

(a) $2^3 \times 5$

Answer:

(b) $2^2 \times 3^2$

Answer:

(c) $2 \times 3^2 \times 5$

Answer:

(d) $2^4 \times 3 \times 7$

Answer:

(e) $3^3 \times 5^2$

Answer:

(f) $2^3 \times 3 \times 5^2$

Answer:

5 Use prime factors to decide whether each number is a square number. If it is, write down its square root.

(a) 36

Answer:

(b) 72

Answer:

(c) 100

Answer:

(d) 180

Answer:

(e) 225

Answer:

(f) 324

Answer:

- 6 A number $N = 2^3 \times 3^2 \times 5$. Without working out N , decide whether each number is a factor of N .

(a) 12

Answer:

(b) 25

Answer:

(c) 40

Answer:

(d) 27

Answer:

(e) 90

Answer:

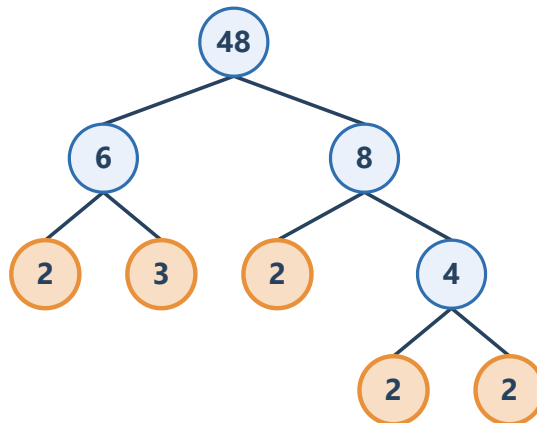
(f) 16

Answer:

- 7 Jan writes $60 = 2 \times 3 \times 10$ and says that this is the prime factorisation of 60. Explain what is wrong and write down the correct prime factorisation.

Answer:

- 8 Amir draws a factor tree for 48 starting 6×8 . Bella starts hers 4×12 . Explain why they both end with the same prime factors.



Answer:

- 9 A cube has a volume of 216 cm^3 . (a) Write 216 as a product of prime factors. (b) Use your answer to find the length of one edge of the cube.

(a) (a)

Answer:

(b) (b)

Answer:

- 10 Which is bigger, $2^5 \times 3$ or $2^2 \times 3^3$? Show your working.

Answer:

11 Write down the number of factors of each number. Use its prime factorisation.

(a) 12

Answer:

(b) 36

Answer:

(c) 60

Answer:

(d) 100

Answer:

(e) 180

Answer:

(f) 360

Answer:

12 Find the smallest positive whole number k so that the product is a perfect square.

(a) $12k$

Answer:

(b) $18k$

Answer:

(c) $50k$

Answer:

(d) $360k$

Answer:

(e) $756k$

Answer:

13 p and q are two different prime numbers. Prove that pq has exactly four factors.

Answer:

14 The number $2^a \times 3$ has exactly 8 factors. Find the value of a and work out the number.

Answer:

15 What is the smallest number that has exactly six factors?

Answer: