

Square and Cube Numbers

1 Christian says, "I know that $7^2 = 49$. So if I double this I get $14^2 = 98$."

Explain why Christian is wrong.



1 mark

Calculate the correct value of 14^2 .



1 mark

2 Fill in the missing numbers.



$$\boxed{}^2 - 59 = 5$$

1 mark



$$\boxed{}^2 + 2^2 = 5^3$$

1 mark



$$\boxed{}^3 \times 2^3 = 4^3$$

1 mark

3 Julia is thinking of a number. She says, "It's $19^2 \times 30^2$."

Without working out Julia's number, show that her number is square.

Hint: write 19^2 as 19×19 , and do the same for 30^2 .



2 marks

Julia says, "If you divide a square number by another square number, you always get a square number." Show that Julia is wrong.



1 mark

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4

Work out:

$$1000^2$$

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1 mark

$$100^3$$

☐

1 mark

5

Some numbers are both square and cube — the first two are 1 and 64:

1 is: 1^3 and 1^2
64 is: 4^3 and 8^2

Raj says, "1 and 4 are the first square numbers, and 1 and 8 are the first cube numbers. So I predict that $9^3 = 27^2$." Is Raj right? Show your working.

☐

2 marks



Factors of a number divide exactly into that number.

For example, 20 has six factors: 1, 2, 4, 5, 10 and 20.

How many factors does 25 have?

Find the number of factors of the other square numbers that are less than 150. What do they all have in common?

Are there any numbers that are not square that also follow this rule? Test this out.

Five of the square numbers that you've looked at so far have an equal amount of factors. What connects these square numbers? Use this to explain why they all have the same amount of factors.

"I can recognise and use square and cube numbers."

