SCIENCE FOUNDATIONS

Calculating averages

Difficulty level: Intermediate

Science Foundations

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Overview of the concept

This is how you boil a bunch of repeated measurements down to one fair number, like your average time on a run or your average score over a season. A runner who runs five times has five different times, and the average is the one number that sums up how they usually run. A student averaging test scores and a driver averaging fuel use over a month are doing the same thing. One fair number is easier to compare and easier to remember than a whole list.



Rule

Calculating averages: mean $= \dfrac{\text{total of the values}}{\text{number of values}}$.

To find a missing total, total = mean × number of values.

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Worked examples

EXAMPLE 1

Q Find the mean of 12 cm, 14 cm, and 16 cm.

SOLUTION

Add the values: 12 + 14 + 16 = 42

Count the values: there are three.

42 ÷ 3 = 14

Mean = 14 cm

The result is 14 cm.

EXAMPLE 2

Q Find the mean of 20 s, 24 s, 22 s, and 26 s.

SOLUTION

Add the values: 20 + 24 + 22 + 26 = 92

Count the values: there are four.

92 ÷ 4 = 23

Mean = 23 s

The result is 23 s.

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Practice questions

1 Three bean plants grew to the heights on the number line. What is their mean height?



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2 Four students wrote a quiz and scored the marks on the number line. What is their mean score?



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3 The temperatures on three days are shown on the number line. What is the mean temperature?



- **A** 18 degrees C
- **B** 17 degrees C
- **C** 19 degrees C
- **D** 20 degrees C

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4 Two seedlings are 100 mm and 110 mm tall. What is their mean height?

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5 The mean mass of three marbles is 4 g. A fourth marble with a mass of 8 g is added. What is the new mean mass?

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6 The mean of six readings is 10. One reading of 4 is removed. What is the mean of the remaining five readings?

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7 The mean of 4 readings is 15. What is their total?

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8 Five bean plants grew by 2 cm, 4 cm, 6 cm, 8 cm and 10 cm in one week. If the tallest plant had grown twice as much, what would the mean growth be?

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9 Five test marks have a mean of 60. Another five test marks have a mean of 70. What is the mean of all ten marks?

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10 A student measures a length four times: 10 cm, 12 cm, 11 cm and 27 cm. The 27 cm reading was a mistake and is dropped. What is the mean of the remaining readings?

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ANSWER KEY

1. 20 cm

2. 8

3. 18 degrees C

4. 105 mm

5. 5 g

6. 11.2

7. 60

8. 8 cm

9. 65

10. 11 cm

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