



CLASS 10 MATHS · 2026-27

Arithmetic progressions

Arithmetic progressions

26

QUESTIONS

30

MINUTES

3

EXERCISES

This belongs to _____

Date _____

WHAT YOU'LL GET GOOD AT

- Identifies the first term and the common difference correctly
- Finds the n th term, and finds which term a given value is
- Finds the sum of the first n terms
- Solves for a and d from two given terms
- Applies an AP to a described situation

Take your time, and have a go at every one. If you get stuck, look at the orange box — Ollie has already done one for you.

Arithmetic progressions

Arithmetic progressions · 26 questions · tick each box as you finish

Exercise 1 of 3 · 10 questions Find what is asked.



WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

The last question is the useful one. If solving for n does not give a positive whole number, the value is not a term of the AP - and saying that explicitly is the answer rather than a dead end. Children often assume they have made an arithmetic mistake and search for one. The non-integer is the result.

1) Find the 10th term of 2, 7, 12, ...

2) Which term of 3, 8, 13, ... is 78?

3) Find the common difference of 10, 7, 4, ...

4) Find the 15th term of the AP whose first term is -5 and common difference is 3.

5) Is 100 a term of the AP 3, 7, 11, ...?

6) Find the 12th term of 5, 9, 13, ...

7) Which term of 7, 13, 19, ... is 103?

8) Find the first term of an AP whose 5th term is 20 and common difference is 3.

9) Is 68 a term of the AP 4, 9, 14, ...?

10) Find the common difference of an AP whose 3rd term is 11 and 8th term is 31.

Exercise 2 of 3 · 8 questions Find the sum.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

When the last term is known, use $S = \frac{n}{2}(a + l)$ rather than the longer formula - it is faster and there is less to get wrong. The step people skip is finding n first, using $n = \frac{l - a}{d} + 1$. That '+1' is the commonest slip in the chapter: from 12 to 99 in steps of 3 there are 29 gaps and 30 numbers.

1) The sum of the first 20 terms of 1, 3, 5, ...

2) The sum of the first 15 terms of the AP with $a = 3$ and $d = 4$.

3) How many two-digit numbers are divisible by 3?

4) Find $7 + 10.5 + 14 + \dots + 84$.

5) Find the sum of the first 25 terms of 3, 7, 11, ...

6) Find the sum of the first 12 terms of 2, 5, 8, ...

7) How many two-digit numbers are divisible by 4, and what is their sum?

8) Find the sum of all multiples of 7 lying between 100 and 200.

Exercise 3 of 3 · 8 questions Work these out.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

The second question is the one worth learning properly, because it looks unfamiliar and has a one-line method: the n th term is the sum of n terms minus the sum of $(n-1)$ terms. Here that is $S_n - S_{n-1} = 350 - 288 = 62$. Any question giving you S_n as a formula is asking you to use that relationship, and recognising it turns a hard-looking question into an easy one.

1) The 5th term of an AP is 19 and the 9th is 35. Find the first term and the common difference.

2) The sum of the first n terms of an AP is $3n^2 + 5n$. Find its 10th term.

3) A person saves ₹100 in the first month and ₹50 more each month than the month before. How much will they have saved in a year?

4) Find the number of terms in the AP 18, 15.5, 13, ..., -47.

5) The 4th term of an AP is 14 and the 10th is 32. Find the first term and the common difference.

6) The sum of the first 10 terms of an AP is 155 and the first term is 2. Find the common difference.

7) Find the middle term of the AP 6, 13, 20, ..., 216.

8) Which term of the AP 5, 2, -1, ... is -49?



All done? How did that feel?

Colour in a star. Three stars means you could teach it to someone else.



Tricky · Getting there · Easy now



Answer key

For grown-ups

Arithmetic progressions · keep this page back until your child has finished.

1. Find what is asked.

- 1) $a = 2, d = 5$, so $a_{16} = 2 + 9(5) = 47$.
- 2) $3 + (n - 1)5 = 78$ gives $(n - 1)5 = 75$ and $n = 16$. It is the 16th term.
- 3) $d = 7 - 10 = -3$.
- 4) $a_{14} = -5 + 14(3) = 37$.
- 5) $3 + (n - 1)4 = 100$ gives $(n - 1)4 = 97$, which is not a whole number when divided by 4. So 100 is not a term of this AP.
- 6) $a = 5, d = 4$, so $a_{12} = 5 + 11(4) = 49$.
- 7) $a = 7, d = 6$, so $7 + (n - 1)6 = 103$ gives $n - 1 = 16$ and $n = 17$.
- 8) $a + 4(3) = 20$, so $a = 8$.
- 9) $4 + (n - 1)5 = 68$ gives $(n - 1)5 = 64$, which is not a whole number, so 68 is not a term.
- 10) $a + 7d - (a + 2d) = 31 - 11$, so $5d = 20$ and $d = 4$.

2. Find the sum.

- 1) $S_{20} = (20/2)[2(1) + 19(2)] = 10(40) = 400$.
- 2) $S_{15} = (15/2)[2(3) + 14(4)] = (15/2)(62) = 465$.
- 3) They form the AP 12, 15, ..., 99. $n = (99 - 12)/3 + 1 = 30$. There are 30 such numbers.
- 4) $a = 7, d = 3.5$, last term 84. $n = (84 - 7)/3.5 + 1 = 23$. $S = (23/2)(7 + 84) = (23/2)(91) = 1046.5$.
- 5) $S_{25} = 25/2 [2(3) + 24(4)] = 25/2 \times 102 = 1,275$.
- 6) $S_{12} = 12/2 [2(2) + 11(3)] = 6 \times 37 = 222$.
- 7) They run 12, 16, ..., 96, so $n = 22$. Sum = $22/2 (12 + 96) = 11 \times 108 = 1,188$.
- 8) They run 105, 112, ..., 196, so $n = 14$. Sum = $14/2 (105 + 196) = 7 \times 301 = 2,107$.

3. Work these out.

- 1) $a + 4d = 19$ and $a + 8d = 35$. Subtracting gives $4d = 16$, so $d = 4$ and $a = 3$.
- 2) $a_{16} = S_{16} - S_{15} = (300 + 50) - (243 + 45) = 350 - 288 = 62$.
- 3) $a = 100, d = 50, n = 12$. $S = (12/2)[200 + 11(50)] = 6(750) = ₹4,500$.
- 4) $d = -2.5$. Then $18 + (n - 1)(-2.5) = -47$ gives $(n - 1)(-2.5) = -65$, so $n - 1 = 26$ and $n = 27$.
- 5) $a + 3d = 14$ and $a + 9d = 32$, so $6d = 18, d = 3$ and $a = 5$.
- 6) $155 = 10/2 [2(2) + 9d] = 5(4 + 9d)$, so $31 = 4 + 9d$ and $d = 3$.
- 7) $a = 6, d = 7$, and $6 + (n - 1)7 = 216$ gives $n = 31$. The middle term is the 16th: $6 + 15(7) = 111$.
- 8) $a = 5, d = -3$, and $5 + (n - 1)(-3) = -49$ gives $(n - 1)(-3) = -54$, so $n = 19$.

WHILE YOUR CHILD WORKS

- Check the common difference is second minus first, not the second term itself. That single slip ruins otherwise perfect work.
- $n = (l - a)/d + 1$. The '+1' is the commonest error in the chapter - 29 gaps means 30 terms.
- If solving for n gives a fraction, the value is not a term of the AP. That is the answer, not a mistake.

**Spotted a gap while marking?**

A free assessment is one live class with a matched teacher - no card, nothing to cancel. Afterwards you get an honest note on what they noticed.

Book a free assessment - scholur.com/contact