Sequences

Algebra · 6 questions · step-by-step answers at the end

Name: Date: Score: / 6

USEFUL EQUATIONS

$u_n = a + (n-1)d$ $u_n = ar^{n-1}$ $u_n = an^2 + bn + c$, a = (second difference)/2

$u_{n+2} = u_{n+1} + u_n$

Questions

Show your working in the space under each question.

1. EASY Find the nth term of 7, 11, 15, 19, …

2. EASY Write the first four terms of the sequence with nth term $5n - 2$.

3. MEDIUM Is 100 a term of the sequence with nth term $3n + 1$?

4. MEDIUM A sequence starts 2, 5, 7, 12, … Each term is the sum of the previous two. Find the next two terms.

5. HARD Find the nth term of 2, 5, 10, 17, ...

6. HARD Find the nth term of 2, 7, 16, 29, 46, ...

Step-by-step answers

Sequences

1. Goes up in 4s; 4n gives 4, 8, 12, so add 3: **$4n + 3$**.
2. **3, 8, 13, 18**.
3. $3n + 1 = 100$ gives $n = 33$, a whole number. **Yes, it is the 33rd term**.
4. $7 + 12 =$ **19**, then $12 + 19 =$ **31**.
5. Differences 3, 5, 7; second difference 2, so n^2. Subtracting n^2 leaves 1 each time: **$n^2 + 1$**.
6. Differences 5, 9, 13, 17; second difference 4, so $2n^2$: 2, 8, 18, 32, 50. Subtract: 0, −1, −2, −3, −4, which is $-n + 1$. **$2n^2 - n + 1$**.