

Foundation GCSE: Sequences — Position-to-Term Rules

Name: _____

Class: _____

Instructions: Answer all questions. Questions are ordered from easiest (1) to hardest (20). Working out should be shown where appropriate.

1. Find the 1st term of the sequence given by the rule $T_n = n + 4$.
2. Find the 3rd term of the sequence given by the rule $T_n = 2n$.
3. Find the 5th term of the sequence given by the rule $T_n = 3n - 1$.
4. Find the 10th term of the sequence given by the rule $T_n = 4n + 5$.
5. Find the first three terms of the sequence $T_n = 5n - 2$.
6. Find the 7th term of the sequence $T_n = 10 - n$.
7. Calculate the 20th term for the position-to-term rule $T_n = 6n + 3$.
8. Find the first four terms of the sequence given by $T_n = n^2$.
9. Find the 6th term of the sequence given by $T_n = n^2 + 3$.
10. Determine whether 42 is in the sequence defined by $T_n = 4n + 2$.
11. Find the 12th term of the sequence $T_n = 3n^2 - 2$.
12. Determine whether 50 is a term in the sequence $T_n = 5n$.
13. Find the 8th term of the sequence given by $T_n = \frac{n}{n+1}$.
14. Find the position (n) of the term whose value is 35 in the sequence $T_n = 4n - 1$.
15. Find the 5th term of the sequence defined by $T_n = 2^n$.
16. Find the position (n) of the term with value 64 in the sequence $T_n = n^2$.
17. Calculate the 50th term of the arithmetic sequence $T_n = 7n - 5$.
18. Find the 10th term of the quadratic sequence $T_n = n^2 + n + 1$.
19. Find the position (n) of the term equal to 104 in the sequence $T_n = 3n^2 - 4$.
20. Find the 15th term of the alternating sequence $T_n = (-1)^n \cdot n$.

Answers & Worked Solutions

1. 5 – Substitute $n = 1$: $1 + 4 = 5$.
2. 6 – Substitute $n = 3$: $2(3) = 6$.
3. 14 – Substitute $n = 5$: $3(5) - 1 = 14$.
4. 45 – Substitute $n = 10$: $4(10) + 5 = 45$.
5. 3, 8, 13 – Substitute $n = 1, 2, 3$.
6. 3 – Substitute $n = 7$: $10 - 7 = 3$.
7. 123 – Substitute $n = 20$: $6(20) + 3 = 123$.
8. 1, 4, 9, 16 – Substitute $n = 1, 2, 3, 4$ into n^2 .
9. 39 – Substitute $n = 6$: $6^2 + 3 = 39$.
10. Yes ($n = 10$) – Solve $4n + 2 = 42 \implies 4n = 40 \implies n = 10$.
11. 430 – Substitute $n = 12$: $3(12^2) - 2 = 3(144) - 2 = 430$.
12. Yes ($n = 10$) – $50 \div 5 = 10$, an integer.
13. $\frac{8}{9}$ – Substitute $n = 8$: $\frac{8}{8+1} = \frac{8}{9}$.
14. $n = 9$ – Solve $4n - 1 = 35 \implies 4n = 36 \implies n = 9$.
15. 32 – Substitute $n = 5$: $2^5 = 32$.
16. $n = 8$ – Solve $n^2 = 64 \implies n = 8$ ($n > 0$).
17. 345 – Substitute $n = 50$: $7(50) - 5 = 345$.
18. 111 – Substitute $n = 10$: $10^2 + 10 + 1 = 111$.
19. $n = 6$ – Solve $3n^2 - 4 = 104 \implies 3n^2 = 108 \implies n^2 = 36 \implies n = 6$.
20. -15 – Substitute $n = 15$: $(-1)^{15} \times 15 = -15$.