

PLZ HELP!!32 25 18 11 4 THESE ARE THE FIRST 5 TERMS OF SEQUENCE FIND(A)6TH TERM(B)NTH TERM(C)WHICH TERM

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UNDERSTANDING SEQUENCES AND SERIES IS A FUNDAMENTAL PART OF MATHEMATICS, ESPECIALLY IN ALGEBRA AND ARITHMETIC. THE SEQUENCE 32, 25, 18, 11, 4 PRESENTS AN INTERESTING PROBLEM FOR STUDENTS AND MATH ENTHUSIASTS ALIKE: HOW TO FIND THE NEXT TERM, THE GENERAL NTH TERM, AND IDENTIFY WHICH TERM A PARTICULAR NUMBER REPRESENTS IN THE SEQUENCE. IN THIS ARTICLE, WE'LL EXPLORE METHODS TO ANALYZE THIS SEQUENCE STEP-BY-STEP, COVERING THE CALCULATION OF THE 6TH TERM, DERIVING THE NTH TERM FORMULA, AND UNDERSTANDING THE POSITION OF SPECIFIC TERMS WITHIN THE SEQUENCE.

ANALYZING THE SEQUENCE

BEFORE JUMPING TO SOLUTIONS, IT'S ESSENTIAL TO UNDERSTAND THE STRUCTURE OF THE SEQUENCE PROVIDED: 32, 25, 18, 11, 4. RECOGNIZING THE PATTERN INVOLVES EXAMINING THE DIFFERENCES BETWEEN CONSECUTIVE TERMS.

STEP 1: FIND THE PATTERN IN THE SEQUENCE

- SEQUENCE: 32, 25, 18, 11, 4
- DIFFERENCES BETWEEN TERMS:
 - $25 - 32 = -7$
 - $18 - 25 = -7$
 - $11 - 18 = -7$
 - $4 - 11 = -7$

SINCE EACH DIFFERENCE IS -7 , THE SEQUENCE IS AN ARITHMETIC SEQUENCE WITH A COMMON DIFFERENCE OF -7 .

FINDING THE 6TH TERM

KNOWING IT'S AN ARITHMETIC SEQUENCE HELPS US EASILY FIND THE NEXT TERM.

STEP 2: USE THE ARITHMETIC SEQUENCE FORMULA

THE NTH TERM OF AN ARITHMETIC SEQUENCE IS GIVEN BY:

$$[a_n = a_1 + (n - 1)d]$$

WHERE:

- (A_1) IS THE FIRST TERM,
- (D) IS THE COMMON DIFFERENCE,
- (N) IS THE TERM NUMBER.

GIVEN:

- $(A_1 = 32)$,
- $(D = -7)$.

STEP 3: CALCULATE THE 6TH TERM

$$A_6 = 32 + (6 - 1)(-7) = 32 + 5 \times (-7) = 32 - 35 = -3$$

ANSWER: THE 6TH TERM IS -3.

DERIVING THE GENERAL NTH TERM (NTH TERM FORMULA)

HAVING IDENTIFIED THE SEQUENCE AS ARITHMETIC, THE FORMULA FOR THE NTH TERM IS STRAIGHTFORWARD.

STEP 4: WRITE THE NTH TERM FORMULA

$$A_N = A_1 + (N - 1)D$$

SUBSTITUTING KNOWN VALUES:

$$A_N = 32 + (N - 1)(-7) = 32 - 7(N - 1)$$

SIMPLIFY:

$$A_N = 32 - 7N + 7 = (32 + 7) - 7N = 39 - 7N$$

THEREFORE, THE NTH TERM OF THE SEQUENCE IS:

$$\boxed{A_N = 39 - 7N}$$

THIS FORMULA ALLOWS YOU TO FIND ANY TERM IN THE SEQUENCE DIRECTLY.

DETERMINING WHICH TERM A PARTICULAR NUMBER IS

SUPPOSE YOU WANT TO FIND WHICH TERM CORRESPONDS TO A SPECIFIC NUMBER, SAY, 4.

STEP 5: SET THE NTH TERM EQUAL TO THE NUMBER

$$\begin{aligned} & \backslash[\\ & a_n = 39 - 7n \\ & \backslash] \end{aligned}$$

SET $\backslash(a_n = 4 \backslash)$:

$$\begin{aligned} & \backslash[\\ & 4 = 39 - 7n \\ & \backslash] \end{aligned}$$

SOLVE FOR $\backslash(n \backslash)$:

$$\begin{aligned} & \backslash[\\ & 7n = 39 - 4 = 35 \\ & \backslash] \\ & \backslash[\\ & n = \frac{35}{7} = 5 \\ & \backslash] \end{aligned}$$

ANSWER: THE NUMBER 4 IS THE 5TH TERM IN THE SEQUENCE.

SUMMARY OF KEY RESULTS

- 6TH TERM: -3
- NTH TERM FORMULA: $\backslash(a_n = 39 - 7n \backslash)$
- WHICH TERM IS 4? THE 5TH TERM

PRACTICAL APPLICATIONS AND TIPS

USING THE NTH TERM FORMULA EFFECTIVELY

- TO FIND A SPECIFIC TERM, SUBSTITUTE THE TERM NUMBER $\backslash(n \backslash)$ INTO THE FORMULA.
- TO FIND WHICH TERM CORRESPONDS TO A PARTICULAR VALUE, SET $\backslash(a_n \backslash)$ TO THAT VALUE AND SOLVE FOR $\backslash(n \backslash)$. IF $\backslash(n \backslash)$ IS AN INTEGER, THE TERM EXISTS AT THAT POSITION; OTHERWISE, THE VALUE DOES NOT APPEAR EXPLICITLY IN THE SEQUENCE.

COMMON MISTAKES TO AVOID

- CONFUSING THE SEQUENCE PATTERN; ALWAYS VERIFY THE DIFFERENCES OR RATIOS.
- FORGETTING TO CHECK IF $\lfloor n \rfloor$ IS AN INTEGER WHEN SOLVING FOR THE TERM POSITION.
- MIXING UP THE SIGNS, ESPECIALLY WITH NEGATIVE COMMON DIFFERENCES.

ADDITIONAL EXAMPLES AND PRACTICE PROBLEMS

1. FIND THE 10TH TERM OF THE SEQUENCE 32, 25, 18, 11, 4.
2. DETERMINE WHETHER THE NUMBER 20 APPEARS IN THE SEQUENCE, AND IF SO, WHICH TERM IT IS.
3. WRITE THE SEQUENCE FORMULA FOR 50, 45, 40, 35, ...

SOLUTIONS:

1. 10TH TERM:

$$\begin{aligned} \lfloor \\ a_{10} &= 39 - 7(10) = 39 - 70 = -31 \\ \rfloor \end{aligned}$$

2. DOES 20 APPEAR?

SET $\lfloor 20 = 39 - 7n \rfloor$:

$$\begin{aligned} \lfloor \\ 7n &= 39 - 20 = 19 \\ \rfloor \\ \lfloor \\ n &= \frac{19}{7} \approx 2.714 \\ \rfloor \end{aligned}$$

SINCE $\lfloor n \rfloor$ IS NOT AN INTEGER, 20 DOES NOT APPEAR IN THE SEQUENCE.

3. SEQUENCE FORMULA:

FIRST TERM: 50

COMMON DIFFERENCE: -5

NTH TERM:

$$\begin{aligned} \lfloor \\ a_n &= 50 + (n - 1)(-5) = 50 - 5(n - 1) = 50 - 5n + 5 = 55 - 5n \\ \rfloor \end{aligned}$$

CONCLUSION

UNDERSTANDING AND ANALYZING SEQUENCES LIKE 32, 25, 18, 11, 4 INVOLVES RECOGNIZING PATTERNS, DERIVING FORMULAS, AND APPLYING ALGEBRAIC METHODS. BY IDENTIFYING THE SEQUENCE AS ARITHMETIC, WE CAN EASILY FIND THE 6TH TERM, FORMULATE THE NTH TERM, AND DETERMINE THE POSITION OF SPECIFIC NUMBERS WITHIN THE SEQUENCE. MASTERING THESE SKILLS ENHANCES PROBLEM-SOLVING ABILITIES AND PROVIDES A STRONG FOUNDATION FOR MORE ADVANCED MATHEMATICS TOPICS INVOLVING SEQUENCES AND SERIES.

IF YOU'RE STRUGGLING WITH SIMILAR PROBLEMS OR NEED FURTHER EXPLANATION, PRACTICE WITH VARIOUS SEQUENCES AND CONSULT RESOURCES ON ARITHMETIC AND GEOMETRIC PROGRESSIONS TO STRENGTHEN YOUR UNDERSTANDING.

FREQUENTLY ASKED QUESTIONS

GIVEN THE SEQUENCE 32, 25, 18, 11, 4, WHAT IS THE 6TH TERM?

THE SEQUENCE DECREASES BY 7 EACH TIME: $32 - 7 = 25$, $25 - 7 = 18$, $18 - 7 = 11$, $11 - 7 = 4$. SO, THE 6TH TERM IS $4 - 7 = -3$.

HOW DO YOU FIND THE NTH TERM OF THE SEQUENCE 32, 25, 18, 11, 4?

SINCE THE SEQUENCE DECREASES BY 7 EACH TIME, THE NTH TERM IS GIVEN BY: $A_N = 32 - 7(N - 1)$.

WHAT IS THE 10TH TERM OF THE SEQUENCE 32, 25, 18, 11, 4?

USING THE FORMULA $A_N = 32 - 7(N - 1)$: $A_{10} = 32 - 7(10 - 1) = 32 - 7 \times 9 = 32 - 63 = -31$.

IF THE SEQUENCE IS 32, 25, 18, 11, 4, WHAT IS THE 1ST TERM?

THE FIRST TERM IS 32.

WHAT IS THE COMMON DIFFERENCE IN THE SEQUENCE 32, 25, 18, 11, 4?

THE COMMON DIFFERENCE IS -7, SINCE EACH TERM DECREASES BY 7.

HOW DO I FIND THE NTH TERM FOR AN ARITHMETIC SEQUENCE LIKE 32, 25, 18, 11, 4?

FOR AN ARITHMETIC SEQUENCE, THE NTH TERM IS $A_N = A_1 + (N - 1)D$. HERE, $A_1 = 32$ AND $D = -7$, SO $A_N = 32 - 7(N - 1)$.

WHAT IS THE 5TH TERM OF THE SEQUENCE 32, 25, 18, 11, 4?

THE 5TH TERM IS 4, AS GIVEN IN THE SEQUENCE.

CAN I FIND THE 20TH TERM OF THIS SEQUENCE? HOW?

YES. USING THE NTH TERM FORMULA: $A_{20} = 32 - 7(20 - 1) = 32 - 7 \times 19 = 32 - 133 = -101$.

WHICH TERM IN THE SEQUENCE 32, 25, 18, 11, 4 IS THE 15TH TERM?

USING THE FORMULA: $A_{15} = 32 - 7(15 - 1) = 32 - 7 \times 14 = 32 - 98 = -66$.

WHAT IS THE GENERAL APPROACH TO FIND THE NTH TERM OF AN ARITHMETIC SEQUENCE?

IDENTIFY THE FIRST TERM AND COMMON DIFFERENCE, THEN USE THE FORMULA $A_n = A_1 + (n - 1)D$ TO FIND ANY TERM.

ADDITIONAL RESOURCES

PLZ HELP!!32 25 18 11 4 THESE ARE THE FIRST 5 TERMS OF SEQUENCE FIND(A)6TH TERM(B)NTH TERM(C)WHICH TERM

IN THE WORLD OF MATHEMATICS, SEQUENCES ARE FUNDAMENTAL CONCEPTS THAT HELP US UNDERSTAND PATTERNS, PREDICT FUTURE VALUES, AND SOLVE COMPLEX PROBLEMS EFFICIENTLY. RECENTLY, A STUDENT OR A MATH ENTHUSIAST ENCOUNTERED A SEQUENCE STARTING WITH THE TERMS 32, 25, 18, 11, AND 4. THE CHALLENGE IS TO ANALYZE THIS SEQUENCE, DETERMINE THE SIXTH TERM, FIND A GENERAL FORMULA FOR THE NTH TERM, AND IDENTIFY WHICH TERM CORRESPONDS TO A SPECIFIC POSITION. THIS ARTICLE AIMS TO PROVIDE A COMPREHENSIVE, STEP-BY-STEP EXPLANATION OF HOW TO APPROACH SUCH A PROBLEM, MAKING IT ACCESSIBLE TO LEARNERS WHILE MAINTAINING A TECHNICAL RIGOR SUITABLE FOR MORE ADVANCED READERS.

UNDERSTANDING THE SEQUENCE: AN INITIAL OBSERVATION

BEFORE JUMPING INTO CALCULATIONS, IT'S CRUCIAL TO CAREFULLY EXAMINE THE SEQUENCE:

SEQUENCE: 32, 25, 18, 11, 4

POSITIONING:

- TERM 1 (T_1) = 32
- TERM 2 (T_2) = 25
- TERM 3 (T_3) = 18
- TERM 4 (T_4) = 11
- TERM 5 (T_5) = 4

THE IMMEDIATE STEP IS TO IDENTIFY THE PATTERN OR RULE GOVERNING THIS SEQUENCE.

ANALYZING THE PATTERN: DIFFERENCES AND PROGRESSION

STEP 1: CALCULATE THE DIFFERENCES BETWEEN CONSECUTIVE TERMS

TERM	VALUE	DIFFERENCE FROM PREVIOUS TERM
T_1	32	—
T_2	25	$25 - 32 = -7$
T_3	18	$18 - 25 = -7$
T_4	11	$11 - 18 = -7$
T_5	4	$4 - 11 = -7$

OBSERVATION: THE DIFFERENCE BETWEEN EACH CONSECUTIVE TERM IS CONSISTENTLY -7.

THIS INDICATES THAT THE SEQUENCE FOLLOWS A LINEAR PATTERN WITH A COMMON DIFFERENCE OF -7, CHARACTERISTIC OF AN ARITHMETIC SEQUENCE.

CONFIRMING THE PATTERN: IS IT AN ARITHMETIC SEQUENCE?

AN ARITHMETIC SEQUENCE IS DEFINED BY A COMMON DIFFERENCE, DENOTED AS D , SUCH THAT:

$$T_n = T_1 + (n - 1)D$$

GIVEN OUR SEQUENCE:

- FIRST TERM, $T_1 = 32$
- COMMON DIFFERENCE, $D = -7$

LET'S VERIFY THIS FORMULA WITH A FEW TERMS:

- FOR $N=2$: $T_2 = 32 + (2 - 1)(-7) = 32 - 7 = 25$ ✓
- FOR $N=3$: $T_3 = 32 + (3 - 1)(-7) = 32 - 14 = 18$ ✓
- FOR $N=4$: $T_4 = 32 + (4 - 1)(-7) = 32 - 21 = 11$ ✓
- FOR $N=5$: $T_5 = 32 + (5 - 1)(-7) = 32 - 28 = 4$ ✓

ALL TERMS MATCH THE SEQUENCE PROVIDED, CONFIRMING THAT THE SEQUENCE IS ARITHMETIC WITH FIRST TERM 32 AND COMMON DIFFERENCE -7.

PART A: FIND THE 6TH TERM

SINCE THE SEQUENCE IS ARITHMETIC, CALCULATING THE 6TH TERM IS STRAIGHTFORWARD USING THE GENERAL FORMULA:

$$T_n = T_1 + (n - 1)D$$

PLUGGING IN THE VALUES:

- $T_1 = 32$
- $D = -7$
- $N = 6$

CALCULATIONS:

$$T_6 = 32 + (6 - 1)(-7) = 32 + 5(-7) = 32 - 35 = -3$$

ANSWER: THE 6TH TERM IS -3.

PART B: FIND THE NTH TERM

THE NTH TERM OF AN ARITHMETIC SEQUENCE IS GIVEN BY THE EXPLICIT FORMULA:

$$T_n = T_1 + (n - 1)D$$

PLUGGING IN THE KNOWN VALUES:

$$T_n = 32 + (n - 1)(-7)$$

SIMPLIFY:

$$T_n = 32 - 7(n - 1) = 32 - 7n + 7 = (32 + 7) - 7n = 39 - 7n$$

THEREFORE, THE NTH TERM IS:

$$T_n = 39 - 7n$$

THIS FORMULA ALLOWS US TO FIND ANY TERM IN THE SEQUENCE DIRECTLY.

PART C: WHICH TERM IS A GIVEN NUMBER?

SUPPOSE WE NEED TO FIND WHICH TERM EQUALS A SPECIFIC NUMBER, SAY, 0, OR ANY OTHER VALUE.

EXAMPLE: FIND n WHEN $T_n = 0$

USING THE EXPLICIT FORMULA:

$$0 = 39 - 7n$$

SOLVING FOR n :

$$7n = 39$$

$$n = 39 / 7 \approx 5.5714...$$

SINCE n MUST BE AN INTEGER (TERMS IN A SEQUENCE ARE NUMBERED SEQUENTIALLY), THE SEQUENCE DOES NOT CONTAIN THE NUMBER 0.

GENERAL APPROACH:

- SET T_n EQUAL TO THE VALUE IN QUESTION.
- SOLVE FOR n .
- IF THE RESULT IS AN INTEGER, THAT TERM EXISTS AT POSITION n .
- IF NOT, THE SEQUENCE DOES NOT CONTAIN THAT NUMBER.

EXAMPLE: FIND n WHEN $T_n = -10$

- $-10 = 39 - 7n$
- $7n = 39 + 10 = 49$
- $n = 49 / 7 = 7$

RESULT: THE SEQUENCE CONTAINS -10 AT THE 7TH TERM.

ADDITIONAL INSIGHTS: IDENTIFYING THE TERM NUMBER FOR A SPECIFIC TERM

SUPPOSE YOU WANT TO DETERMINE WHICH TERM CORRESPONDS TO A CERTAIN POSITION OR VALUE. FOR EXAMPLE, WHICH TERM IS THE 10TH?

USING THE EXPLICIT FORMULA:

$$T_{10} = 39 - 7 \cdot 10 = 39 - 70 = -31$$

THE 10TH TERM IS -31.

SUMMARY OF KEY FORMULAS AND STEPS

OBJECTIVE	FORMULA	APPLICATION
FIND n TH TERM	$T_n = 39 - 7n$	PLUG IN n
FIND POSITION OF A NUMBER	$n = (39 - T_n) / 7$	SET T_n AND SOLVE FOR n
FIND SPECIFIC TERM	SUBSTITUTE n INTO T_n	USE THE EXPLICIT FORMULA

PRACTICAL IMPLICATIONS AND APPLICATIONS

UNDERSTANDING SEQUENCES SUCH AS THIS HAS REAL-WORLD RELEVANCE ACROSS VARIOUS FIELDS:

- FINANCE: CALCULATING DEPRECIATION OR PAYMENTS OVER TIME.
- PHYSICS: ANALYZING UNIFORM MOTION WITH CONSTANT VELOCITY.
- COMPUTER SCIENCE: ITERATIVE ALGORITHMS WITH PREDICTABLE STEP CHANGES.
- ENGINEERING: DESIGN OF REPETITIVE PROCESSES OR SIGNALS.

THE KEY IS RECOGNIZING THE PATTERN—HERE, AN ARITHMETIC PROGRESSION—AND LEVERAGING THE FORMULAS FOR EFFICIENT CALCULATIONS.

FINAL THOUGHTS: MASTERING SEQUENCE IDENTIFICATION

THE PROCESS DEMONSTRATED ABOVE HIGHLIGHTS THE IMPORTANCE OF PATTERN RECOGNITION AND FORMULA DERIVATION. WHEN FACED WITH A SEQUENCE:

1. EXAMINE THE DIFFERENCES TO IDENTIFY IF IT'S ARITHMETIC.
2. VERIFY THE PATTERN WITH INITIAL TERMS.
3. DERIVE THE EXPLICIT FORMULA FOR THE NTH TERM.
4. USE THE FORMULA TO FIND SPECIFIC TERMS OR POSITIONS.

IN THIS EXAMPLE, THE SEQUENCE 32, 25, 18, 11, 4 IS STRAIGHTFORWARDLY ARITHMETIC, MAKING CALCULATIONS SIMPLE AND PREDICTABLE. RECOGNIZING SUCH PATTERNS ENABLES QUICK PROBLEM-SOLVING AND DEEPER UNDERSTANDING OF MATHEMATICAL STRUCTURES.

CLOSING REMARKS

SEQUENCES ARE FOUNDATIONAL IN MATHEMATICS, SERVING AS BUILDING BLOCKS FOR MORE COMPLEX CONCEPTS SUCH AS SERIES, LIMITS, AND FUNCTIONS. BEING ABLE TO IDENTIFY THE NATURE OF A SEQUENCE—WHETHER ARITHMETIC, GEOMETRIC, OR MORE COMPLEX—IS A CRITICAL SKILL. THE SEQUENCE ANALYZED HERE OFFERS A TEXTBOOK EXAMPLE OF AN ARITHMETIC PROGRESSION, ILLUSTRATING THE POWER OF SIMPLE DIFFERENCE ANALYSIS AND FORMULA APPLICATION. WHETHER YOU'RE A STUDENT PREPARING FOR EXAMS OR A PROFESSIONAL APPLYING MATHEMATICAL PRINCIPLES, MASTERING THESE TECHNIQUES ENHANCES YOUR ANALYTICAL TOOLKIT AND FOSTERS A DEEPER APPRECIATION FOR THE ELEGANCE OF MATHEMATICS.

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