

Algebra 1
Discrete Functions & Arithmetic Sequences | Algebra 1 | 2-Topic Bundle

2-topic bundle | 192 problems | Four activity formats

- 01 Sequences as Discrete Functions**
View individual product and its full preview
- 02 Arithmetic Sequence Explicit and Recursive Rules**
View individual product and its full preview

In every topic

Answer Bank Challenge	24 tasks
Grid Rounds	24 tasks
Match & Move	24 cards
Error Analysis & Strategy	24 tasks
Quick Answer Key and Full Worked Solutions	included
Teacher / Parent Use Guide and Terms of Use	included

Product previews

The following preview pages show the cover, all four activity formats, and worked examples for each included resource, in the listed order.

16 PDFs and 2 READMEs; 107 buyer PDF pages across the 2 products.
Preview pages are not included in the buyer page count. Check the list against resources you already own.

Algebra 1
Sequences as Discrete Functions

Discrete vs. Continuous Functions and Domain | A1-U04-P10

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

Topic focus
Across 96 tasks this topic asks for verified sequence interpretation, value, domain, graph, or judgment.
8 PDFs and a README; 61 buyer pages.

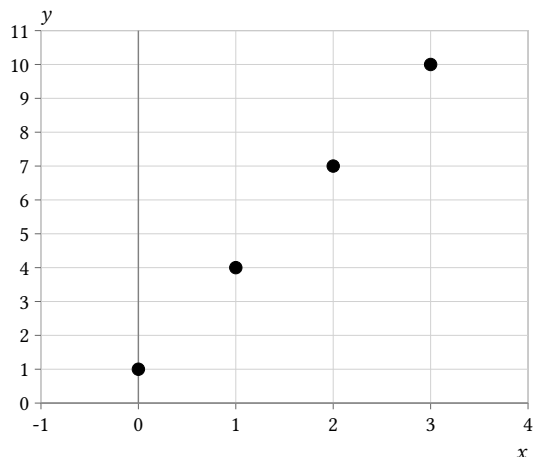
Algebra 1

Sequences as
Discrete Functions

Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

A graph shows filled points $(0, 1)$, $(1, 4)$, $(2, 7)$, $(3, 10)$ and explicitly says the sequence ends at $n = 3$. Should an arrow extend the pattern?



Bank label: _____

A listed sequence starts at index 3: $x_3=20$, $x_4=17$, $x_5=14$. Which notation names the first listed value?

Index	Value
3	20
4	17
5	14

Bank label: _____

Given $d_1=20$ and $d_n=d_{n-1}-n$ for $n \geq 2$, generate d_2 , d_3 , d_4 .

Bank label: _____

A sequence starts 1, 2, 5 and is explicitly known to have constant second difference 2. Is the next term determined?

Bank label: _____

Algebra 1

Sequences as
Discrete Functions

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Given $a_n = n^2 - 3n + 5$ for positive integers, compute a_1, a_4, and a_7. _____ _____	A sequence begins at $n = 4$ and follows $t_n = 5 + 3(n - 4)$. Find t_4 and t_9. _____ _____
For $n = 1, 2, 3, \dots$, the sequence is $a_n = 3n + 2$. Find a_4. _____ _____	A sequence is defined only at perfect-square indices no greater than 25, beginning with 1. List the domain. _____ _____
For $n = 0, 1, 2, \dots$, define q_n as n plus -1 raised to the nth power. Find q_2 and q_3. _____ _____	A sequence is defined only for n in $\{1, 4, 9, 16\}$ by $d_n = \sqrt{n} + n$. Evaluate d_9 and decide whether d_{10} exists. _____ _____

Algebra 1

Sequences as
Discrete Functions

Name: _____ Date: _____ Class: _____

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: Sample 4 has measured temperature 18.5 degrees. The pairs for a sequence are $(1, 5)$, $(2, 8)$, $(3, 5)$. What does q_3 equal? <table border="1" data-bbox="151 594 797 716"> <thead> <tr> <th>Index</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>5</td> </tr> <tr> <td>2</td> <td>8</td> </tr> <tr> <td>3</td> <td>5</td> </tr> </tbody> </table> Your response: _____	Index	Value	1	5	2	8	3	5	Incoming: The lookup gives $q_3 = 5$. Let $e_0=2$ and $e_n=e_{n-1}+2n$ for $n \geq 1$. Determine e_1 through e_3. Your response: _____
Index	Value								
1	5								
2	8								
3	5								
Incoming: The table entry is $c_0 = 7$. The sequence T_k gives the temperature of sample k, and samples are numbered starting at 1. Interpret $T_4=18.5$. Your response: _____	Incoming: No. $A_3 = 9$, whereas $B_3 = 15$. The rule $d_n=5 - 4n$ applies for $n = 1, 2, 3, \dots$. Find d_3. Your response: _____								
Incoming: The rule gives $p_6 = 15$. The rule e_n is supplied for integers $2 \leq n \leq 6$. List its domain. Your response: _____	Incoming: The fifth term is $b_5 = 10$. The rule $j_n=(n-2)^2 + 1$ is defined for $n = 0, 1, \dots, 6$. Fill the entries for $n = 2$ and $n = 5$. Your response: _____								

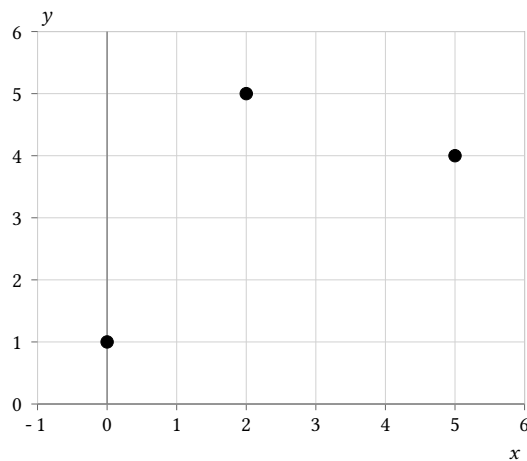
Algebra 1

Sequences as Discrete Functions

Name: _____ Date: _____ Class: _____

Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

A sequence graph has exactly $(0, 1), (2, 5), (5, 4)$. A student adds points $(1, 3), (3, \frac{14}{3}), (4, \frac{13}{3})$ by connecting segments. Diagnose all added points.

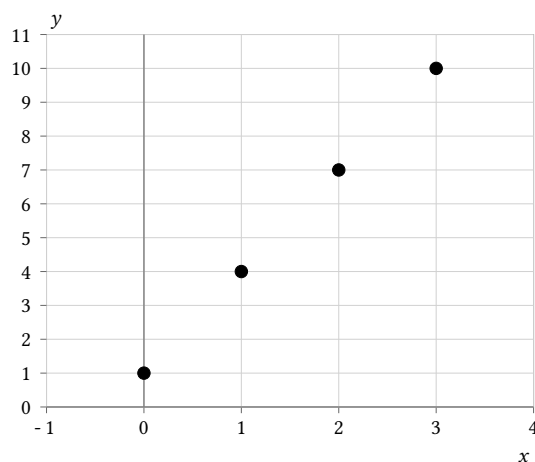


Sequences as Discrete Functions

Full Worked Solutions - excerpt

Worked example

Problem. A graph shows filled points $(0, 1), (1, 4), (2, 7), (3, 10)$ and explicitly says the sequence ends at $n = 3$. Should an arrow extend the pattern?



Answer. No. The graph is exactly those four points and has no continuation arrow.

Explanation and check.

A visible pattern does not override the stated finite domain $\{0, 1, 2, 3\}$.

Worked example

Problem. Given $d_1 = 20$ and $d_n = d_{n-1} - n$ for $n \geq 2$, generate d_2, d_3, d_4 .

Answer. The values are $d_2 = 18, d_3 = 15$, and $d_4 = 11$.

Explanation and check.

Subtract 2, then 3, then 4 from the current preceding value.

Algebra 1
Arithmetic Sequence Explicit and Recursive Rules

Arithmetic Sequence Explicit and Recursive Rules | A1-U04-P11

96 problems · Four activity formats

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Topic focus
Across 96 tasks this topic asks for derived rule, comparison, diagnosis, or justified conclusion.
8 PDFs and a README; 46 buyer pages.

Algebra 1

Arithmetic Sequence Explicit and Recursive Rules

Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. A value without its unit is not a complete answer.

A declared arithmetic sequence has $a_1 = 4$ and $a_2 = 7$. Its domain is the integers $n \geq 1$. Derive both an explicit rule and a recursive rule. _____ Bank label: _____	A book club log has 0 pages at index 0 and changes by 15 pages per index. Here n counts finished sessions. Write matching explicit and recursive rules for the recorded quantity b_n. _____ Bank label: _____
Translate this initialized recurrence into one explicit formula: $a_6 = -2$, $a_n = a_{n-1} + 4$ for integers $n \geq 7$. _____ Bank label: _____	The same sequence is given by $c_n = -5 + 2(n - 4)$; $c_4 = -5$, $c_n = c_{n-1} + 2$. For the task 'explain the change from one stage to the next', choose a useful form and justify the choice. _____ Bank label: _____
Translate this initialized recurrence into one explicit formula: $a_1 = 3$, $a_n = a_{n-1} + 4$ for integers $n \geq 2$. _____ Bank label: _____	A planted tree row has 23 trees at index 4 and changes by 3 trees per index. Here the first supplied row is row 4. Write matching explicit and recursive rules for the recorded quantity p_n. _____ Bank label: _____
Replace the repeated update with direct index access: $a_1 = 10$, $a_n = a_{n-1} - 2$ for integers $n \geq 2$. _____ Bank label: _____	$d_2 = 6$, $d_3 = 2$, and $d_n = 2d_{n-1} - d_{n-2}$ for $n \geq 4$. Find d_4, d_5, d_6 and decide whether the observed change is constant. _____ Bank label: _____

Algebra 1

Arithmetic Sequence Explicit and Recursive Rules

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. A value without its unit is not a complete answer.

Express the same indexed sequence without predecessor notation: $a_7 = 5, a_n = a_{n-1} - 1$ for integers $n \geq 8$. _____ _____	A savings envelope has 25 dollars at index 0 and changes by 6 dollars per index. Here n counts completed weekly deposits. Write matching explicit and recursive rules for the recorded quantity a_n. _____ _____
Write a closed arithmetic rule equivalent to $a_1 = -7, a_n = a_{n-1} - 4$ for integers $n \geq 2$. _____ _____	A candle measurement has 30 centimeters at index 0 and changes by -1 centimeters per index. Here n counts elapsed hours. The record stops at index 30. Write matching explicit and recursive rules for the recorded quantity c_n. _____ _____
Express the same indexed sequence without predecessor notation: $a_1 = 8, a_n = a_{n-1} + 0$ for integers $n \geq 2$. _____ _____	A constant-additive sequence includes $a_1 = 12$ and $a_5 = 0$. Its domain is the integers $n \geq 1$. Derive both an explicit rule and a recursive rule. _____ _____

Algebra 1

Arithmetic Sequence Explicit and Recursive Rules

Name: _____ Date: _____ Class: _____

Begin at START. Answer the card, then find the matching final answer at the top of another card. Use the recording sheet for your reasoning. Visit each card once and continue to FINISH.

Incoming: $a_3 = 15$. Translate this initialized recurrence into one explicit formula: $a_{-2} = 9, a_n = a_{n-1} - 4$ for integers $n \geq -1$. Your response: _____	Incoming: For integers $n \geq -2, a_n = 9 - (4)(n + 2)$. Reverse the known additive updates to recover the anchor: $a_n = a_{n-1} + \frac{3}{2}$ for $n \geq 1$, and $a_9 = \frac{27}{2}$. The sequence begins at $n = 0$. Find a_0. Your response: _____
Incoming: For integers $n \geq 8, a_n = 17 - (3)(n - 8)$. Determine the missing initial value for this forward recurrence: $a_n = a_{n-1} + \frac{7}{3}$ for $n \geq 4$, and $a_{15} = 43$. The sequence begins at $n = 3$. Find a_3. Your response: _____	Incoming: For integers $n \geq 3, a_n = 11 - (6)(n - 3)$. Supply both parts of the recursive specification for $a_n = (0)n + 6$ for integers $n \geq 1$. Your response: _____
Incoming: For integers $n \geq 0, a_n = -\frac{3}{2} + (\frac{5}{2})(n)$. Work backward by the indexed number of steps: $a_n = a_{n-1} + 0$ for $n \geq 8$, and $a_{19} = 19$. The sequence begins at $n = 7$. Find a_7. Your response: _____	Incoming: $a_4 = 25, a_n = a_{n-1} + 6$ for integers $n \geq 5$. $b_0 = 1, b_1 = 4$, and $b_n = b_{n-1} + 2b_{n-2}$ for $n \geq 2$. Compute b_2, b_3, b_4. Your response: _____

Algebra 1

Arithmetic Sequence Explicit and Recursive Rules

Name: _____ Date: _____ Class: _____

Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

Audit this sequence work: Terms are 5, 8, 11, ... at $n = 1, 2, 3, \dots$. A student proposes $a_n = 5 + 3n$. Identify the defect and state a correction.

Audit this sequence work: A student converts $b_n = 9 + 4n$ for $n \geq 0$ to $b_0 = 9, b_n = b_{n-1} + 9$. Identify the defect and state a correction.

Audit this sequence work: A table gives $g_2 = 11, g_5 = 2$ for an arithmetic sequence. A proposed rule is $g_n = 11 - 9(n - 2)$. Identify the defect and state a correction.

Audit this sequence work: For $a_n = 7 - 2(n - 4), n \geq 4$, a student gives the recurrence $a_1 = 7, a_n = a_{n-1} - 2$. Identify the defect and state a correction.

Arithmetic Sequence Explicit and Recursive Rules

Full Worked Solutions - excerpt

Worked example

Problem. Convert the explicit arithmetic rule to a complete recurrence: $a_n = (3)n + 2$ for integers $n \geq 1$.

Answer. $a_1 = 5, a_n = a_{n-1} + 3$ for integers $n \geq 2$.

Explanation and check.

The coefficient of n is the consecutive-term difference; evaluate the formula at the first allowed index for the anchor.

Worked example

Problem. Convert the explicit arithmetic rule to a complete recurrence: $a_n = (-5)n + 20$ for integers $n \geq 6$.

Answer. $a_6 = -10, a_n = a_{n-1} - 5$ for integers $n \geq 7$.

Explanation and check.

The coefficient of n is the consecutive-term difference; evaluate the formula at the first allowed index for the anchor.