TERM-TO-TERM RULES

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

A term-to-term rule tells you how to get from one term to the next.

Rule: add 4 to the previous term.



1 Use the rule to complete each chain.

a) 3 → + 4 → ☐ → + 4 → ☐ → + 4 → ☐

b) 20 → – 3 → ☐ → – 3 → ☐ → – 3 → ☐

c) 1 → × 2 → ☐ → × 2 → ☐ → × 2 → ☐

2 Complete the term-to-term rule for each sequence.

a) **11, 17, 23, 29, ...** Rule: add ☐

b) **50, 40, 30, 20, ...** Rule: subtract ☐

c) **9, 18, 36, 72, ...** Rule: multiply by ☐

3 The rule is "add 4 to the previous term" and the 1st term is 3. Amy writes:

3, 7, 11, 14, 18

a) Circle Amy's first mistake.

b) Write the correct sequence: **3,** ☐, ☐, ☐, ☐

4 Both sequences use the rule "add 3 to the previous term".

a) When the 1st term is 1: **1,** ☐, ☐, ☐, ☐

b) When the 1st term is 2: **2,** ☐, ☐, ☐, ☐

TERM-TO-TERM RULES

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Say what to do to the previous term.

Write "subtract 4 from the previous term", not just "subtract 4".



1 Write the term-to-term rule for each sequence in a full sentence.

a) **15, 13, 11, 9, ...** .....

b) **13, 18, 23, 28, ...** .....

c) **12, 24, 48, 96, ...** .....

2 Use the 1st term and the rule to write the first five terms.

a) **The 1st term is 4. Multiply the previous term by 3.**

4, ☐, ☐, ☐, ☐

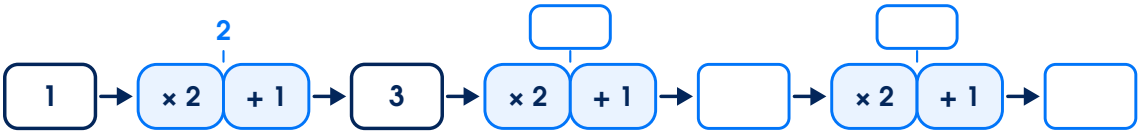
b) **The 1st term is 100. Halve the previous term.**

100, ☐, ☐, ☐, ☐

c) **The 1st term is 6. Add 7 to the previous term.**

6, ☐, ☐, ☐, ☐

3 The rule is "multiply the previous term by 2, then add 1". The 1st term is 1.



Write the first five terms: **1, 3,** ☐, ☐, ☐

4 The 1st term is 9. The rule is "add 5 to the previous term".

Is 50 in the sequence? Explain how you know.

.....

TERM-TO-TERM RULES

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

A term-to-term rule says how to get from one term to the next, e.g. "multiply the previous term by 3". Rules can have two steps or use two previous terms. A rule alone does not fix a sequence: you also need a term.

FLUENCY

1 Complete the table.

SEQUENCE	TERM-TO-TERM RULE	NEXT TWO TERMS
13, 21, 29, 37		
4, 12, 36, 108		
90, 81, 72, 63		
3, 1, 4, 5, 9		
2.5, 3.2, 3.9, 4.6		

2 Write the first four terms of each sequence.

a) **1st term 2: multiply the previous term by 3, then subtract 1**

2, ☐, ☐, ☐

b) **1st term 20: halve the previous term, then add 6**

20, ☐, ☐, ☐

REASONING

3 A sequence starts 3, 6, ... Write three different rules and the next two terms for each.

a) Rule: _____ 3, 6, ☐, ☐

b) Rule: _____ 3, 6, ☐, ☐

c) Rule: _____ 3, 6, ☐, ☐

4 Lily says, "7, 14, 28, 56 is linear because it has a term-to-term rule." Explain why Lily is wrong.

_____

TERM-TO-TERM RULES

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Here is a sequence:

3a + b, 4a + 4b, 5a + 7b, 6a + 10b, ...

a) Write the term-to-term rule. .....

b) Write the next two terms. ☐ ☐

2 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) Two sequences with the same rule have the same terms. ALWAYS SOMETIMES NEVER

b) The rule "subtract 3" gives a descending sequence. ALWAYS SOMETIMES NEVER

c) With "multiply by 2", every term after the 1st is even. ALWAYS SOMETIMES NEVER

d) The rule "multiply by 1" gives a linear sequence. ALWAYS SOMETIMES NEVER

.....

PROBLEM SOLVING

3 Each sequence has a two-step rule. Find it.

a) **2, 7, 22, 67, ...** multiply by ☐ then ☐

b) **3, 5, 9, 17, ...** multiply by ☐ then ☐

★ CHALLENGE FOR ALL

4 Rule: if the previous term is even, halve it. If it is odd, multiply it by 3 and add 1.

a) Start at 6. Keep going until you reach 1.

6, ☐, ☐, ☐, ☐, ☐, ☐, ☐, ☐

b) Which start from 1 to 10 takes the most steps to reach 1? How many?

☐ ☐

TERM-TO-TERM RULES – ANSWERS

ANSWERS

BUILDING BLOCKS

1 a) 7, 11, 15 · b) 17, 14, 11 · c) 2, 4, 8

2 a) 6 · b) 10 · c) 2

3 a) 14 · b) 3, 7, 11, 15, 19

4 a) 1, 4, 7, 10, 13 · b) 2, 5, 8, 11, 14

SUPPORT

1 a) subtract 2 from the previous term · b) add 5 to the previous term · c) multiply the previous term by 2

2 a) 4, 12, 36, 108, 324 · b) 100, 50, 25, 12.5, 6.25 · c) 6, 13, 20, 27, 34

3 chain: 6, 7, 14, 15 · first five terms: 1, 3, 7, 15, 31

4 No: the terms are 9, 14, 19, ... (always 4 more than a multiple of 5), so the sequence goes 49, 54 and misses 50

CORE

1 add 8; 45, 53 · multiply by 3; 324, 972 · subtract 9; 54, 45 · add the two previous terms; 14, 23 · add 0.7; 5.3, 6

2 a) 2, 5, 14, 41 · b) 20, 16, 14, 13

3 e.g. add 3: 9, 12 · multiply by 2: 12, 24 · add the two previous terms: 9, 15

4 Its rule multiplies by 2, so the differences (7, 14, 28) are not constant. Non-linear sequences have term-to-term rules too

GREATER DEPTH

1 a) add a + 3b to the previous term · b) 7a + 13b, 8a + 16b

2 a) Sometimes · b) Always · c) Sometimes (1.5 → 3) · d) Always (common difference 0)

3 a) multiply by 3, then add 1 · b) multiply by 2, then subtract 1

4 a) 3, 10, 5, 16, 8, 4, 2, 1 · b) 9, which takes 19 steps