Honors PreCalculus Name_____

Target 7B&C: Arithmetic and Geometric Sequences

Date_____

Determine if the sequence is geometric. If it is, find the common ratio, the 8th term, the explicit formula, and the recursive formula.

1) 3, −15, 75, −375, ...

2) −27, −9, −3, −1, ...

3) 4, 20, 100, 500, ...

4) $-4, -\frac{8}{3}, -\frac{16}{9}, -\frac{32}{27}, \ldots$

Given two terms in a geometric sequence find the common ratio, the 8th term, the explicit formula, and the recursive formula.

5) $a_5 = -\frac{4}{9}$ and $a_4 = -\frac{2}{3}$

6) $a_1 = -4$ and $a_6 = -12500$

Given a term in a geometric sequence and the common ratio find the 8th term, the explicit formula, and the recursive formula.

7) $a_4 = 12,\ r = -2$

8) $a_6 = -9375,\ r = 5$

Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, the explicit formula, and the recursive formula.

9) $-6,\ -16,\ -26,\ -36,\ ...$

10) $4,\ 16,\ 36,\ 64,\ ...$

Given two terms in an arithmetic sequence find the common difference, the 52nd term, the explicit formula, and the recursive formula.

11) $a_{14} = 121$ and $a_{39} = 371$

12) $a_{17} = 68$ and $a_{36} = 163$

Given a term in an arithmetic sequence and the common difference find the 52nd term, the term named in the problem, the explicit formula, and the recursive formula.

13) $a_9 = 181,\ d = 20$
Find a_{21}

14) $a_{28} = -5389,\ d = -200$
Find a_{25}

Answers to Target 7B&C: Arithmetic and Geometric Sequences

1) Common Ratio: $r = -5$
$a_8 = -234375$
Explicit: $a_n = 3 \cdot (-5)^{n-1}$
Recursive: $a_n = a_{n-1} \cdot -5$
$a_1 = 3$

2) Common Ratio: $r = \frac{1}{3}$
$a_8 = -\frac{1}{81}$
Explicit: $a_n = -27 \cdot \left(\frac{1}{3}\right)^{n-1}$
Recursive: $a_n = a_{n-1} \cdot \frac{1}{3}$
$a_1 = -27$

3) Common Ratio: $r = 5$
$a_8 = 312500$
Explicit: $a_n = 4 \cdot 5^{n-1}$
Recursive: $a_n = a_{n-1} \cdot 5$
$a_1 = 4$

4) Common Ratio: $r = \frac{2}{3}$
$a_8 = -\frac{512}{2187}$
Explicit: $a_n = -4 \cdot \left(\frac{2}{3}\right)^{n-1}$
Recursive: $a_n = a_{n-1} \cdot \frac{2}{3}$
$a_1 = -4$

5) Common Ratio: $r = \frac{2}{3}$
$a_8 = -\frac{32}{243}$
Explicit: $a_n = -\frac{9}{4} \cdot \left(\frac{2}{3}\right)^{n-1}$
Recursive: $a_n = a_{n-1} \cdot \frac{2}{3}$
$a_1 = -\frac{9}{4}$

6) Common Ratio: $r = 5$
$a_8 = -312500$
Explicit: $a_n = -4 \cdot 5^{n-1}$
Recursive: $a_n = a_{n-1} \cdot 5$
$a_1 = -4$

7) $a_8 = 192$
Explicit: $a_n = -1.5 \cdot (-2)^{n-1}$
Recursive: $a_n = a_{n-1} \cdot -2$
$a_1 = -1.5$

8) $a_8 = -234375$
Explicit: $a_n = -3 \cdot 5^{n-1}$
Recursive: $a_n = a_{n-1} \cdot 5$
$a_1 = -3$

9) Common Difference: $d = -10$
$a_{52} = -516$
Explicit: $a_n = 4 - 10n$
Recursive: $a_n = a_{n-1} - 10$
$a_1 = -6$

10) Not arithmetic

11) Common Difference: $d = 10$
$a_{52} = 501$
Explicit: $a_n = -19 + 10n$
Recursive: $a_n = a_{n-1} + 10$
$a_1 = -9$

12) Common Difference: $d = 5$
$a_{52} = 243$
Explicit: $a_n = -17 + 5n$
Recursive: $a_n = a_{n-1} + 5$
$a_1 = -12$

13) $a_{52} = 1041$
$a_{21} = 421$
Explicit: $a_n = 1 + 20n$
Recursive: $a_n = a_{n-1} + 20$
$a_1 = 21$

14) $a_{52} = -10189$
$a_{25} = -4789$
Explicit: $a_n = 211 - 200n$
Recursive: $a_n = a_{n-1} - 200$
$a_1 = 11$