

Algebra 2
Sequences Review

Name: key
Date: _____ Period: _____

Indicate whether ARITHMETIC or a GEOMETRIC sequence (circle one). Then state d or r.

- 1) 2, -10, 50, -250, ... $\frac{50}{-10} = -5$, $\frac{-250}{50} = -5$ Arithmetic / Geometric d/r = r = -5
- 2) 1.5, 2, 2.5, 3, ... Arithmetic / Geometric d/r = 0.5
- 3) 2, 8, 32, 128, ... $\frac{32}{8} = 4$, $\frac{8}{2} = 4$ Arithmetic / Geometric d/r = 4
- 4) 1, 3, 9, 27, ... Arithmetic / Geometric d/r = 3
- 5) 1, 4, 7, 10, ... Arithmetic / Geometric d/r = 3

6) Find the 12th term in the sequence that begins 3, 6, 9, ... $d = 3$

$$a_{12} = 3 + (12-1)(3)$$

$$a_{12} = 36$$

7) Find the 8th term in the sequence that begins 3, 12, 48, 192, ... $r = 4$

$$a_8 = 3(4)^{(8-1)} = 49,152$$

Find the missing term in the arithmetic sequence.

8) ..., 13, 25, 37, ... $\frac{13+37}{2}$

9) ..., 26, 34, 42, ... $\frac{26+42}{2}$

Find the missing term in the geometric sequence.

10) ..., 4, 8, 16, ... $\sqrt{(4 \cdot 16)}$

11) ..., 9, 15, 25, ... $\sqrt{(9 \cdot 25)}$

12) A house was worth \$250,000 when purchased. The following year it was worth \$242,000, and the year after that it was worth \$234,000.

- a) What kind of sequence is this? Arithmetic / Geometric (Circle one)
 b) Write the first six terms of the sequence representing the house's worth each year (first term is 250,000)

250000, 242000, 234000, 226000, 218000, 210000, ...

- c) State the common difference or common ratio $d = -8000$
 d) Write the explicit formula that models the sequence described, then find the value of the house in the 11th year using your formula.

$$a_n = 250000 + (n-1)(-8000)$$

$$a_{11} = 250000 + (11-1)(-8000)$$

$$a_{11} = \$170000$$

13) A fruit fly receives genetic material from two parents. Each parent also receives genetic material from 2 parents. So each fruit fly receives genes from 4 grandparents, 8 great-grandparents, and so on. How many ancestors does a fruit fly have going back 15 generations?

- a) What kind of sequence is this? Arithmetic / Geometric (Circle one)
 b) Write the first six terms of the sequence representing the number of ancestors each year (first term is 2)

2, 4, 8, 16, 32, 64, ...

- c) State the common difference or common ratio $r = 2$
 d) Write the explicit formula that models the sequence described, then find the number of ancestors a fruit fly has going back 15 generations using your formula.

$$a_n = 2(2)^{n-1}$$

$$a_{15} = 2(2)^{(15-1)} = 32,768$$

14) **Error Analysis** Your friend used the arithmetic mean to find the missing term in the following sequence: 3, ____, 29, 42, His answer was 13. What error did your friend make? What is the correct answer?

$$\frac{3+29}{2} = \frac{32}{2} = 16$$

He found the common difference