56.

5/20

**HW: Geometric Sequence . . .** glue on page 56
Use pages 57 – 59 to show your work.
Given the recursive formula for a geometric sequence find the common ratio, the first five terms, and the explicit formula.

1) $a_n = a_{n-1} \cdot 2$
$a_1 = 2$

2) $a_n = a_{n-1} \cdot -3$
$a_1 = -3$

3) $a_n = a_{n-1} \cdot 5$
$a_1 = 2$

Given a term in a geometric sequence and the common ratio find the first five terms, the explicit formula, and the recursive formula.

4) $a_4 = 25$, $r = -5$

5) $a_1 = 4$, $r = 5$

6) $a_3 = 32$, $r = 4$

7) Given two terms in a geometric sequence find the 8th term and the recursive formula. $a_5 = 768$ and $a_2 = 12$

8.) Given the following geometric sequences: 9, –3, 1, ...
Find a and r and state the formula for the explicit formula. Then find the values of the 4th term and the 12th term.

Determine if the following sequences is arithmetic, geometric, or neither? If they are arithmetic, state the value of d. If they are geometric, state r. Then state the explicit formula and the 7th term.

9.) 6, 12, 18, 24, ... (+6 +6 +6) arithmetic, d = 6

10.) 6, 11, 17, ... neither

11.) 2, 14, 98, 686, ... (×7 ×7) geometric, r = 7

12.) 160, 80, 40, 20, ... ($\times(\frac{1}{2})$) geometric, $r = \frac{1}{2}$

13.) –40, –25, –10, 5, .... (+15) arithmetic, d = 15

14.) 7, –21, 63, –189, ... (× –3) geometric, r = –3

HW 5/20

1.) $a_n = a_{n-1} \cdot (2)$
$a_2 = a_1 (2)$
$a_2 = 2(2)$
$a_2 = 4$

$a_3 = a_2 (2)$
$a_3 = 4(2)$
$a_3 = 8$

$a_4 = \overset{a_3}{8}(2)$
$a_4 = 16$

$a_5 = \overset{a_4}{16}(2)$
$a_5 = 32$

$\rightarrow$ Explicit formula
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = 2(2)^{(n-1)}$

2.) $a_n = a_{n-1} \cdot (-3)$
$a_2 = a_1 (-3)$
$a_2 = -3(-3)$
$a_2 = 9$

$a_3 = 9(-3)$
$a_3 = -27$

$a_4 = -27(-3)$
$a_4 = 81$

$a_5 = 81(-3)$
$a_5 = -243$

$\rightarrow$ Explicit formula
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = -3(-3)^{(n-1)}$

3.) $a_n = a_{n-1} (5)$
$a_n = a_1 (5)$
$a_2 = 2(5)$
$a_2 = 10$

$a_3 = 10(5)$
$a_3 = 50$

$a_4 = 50(5)$
$a_4 = 250$

$a_5 = 250(5)$
$a_5 = 1250$

Explicit formula
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = 2(5)^{(n-1)}$

4.) $a_1 = -\frac{1}{5}$ ×-5
$a_2 = 1$
$a_3 = -5$
start → $a_4 = 25$
$a_5 = -125$

Explicit
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = (-\frac{1}{5})(-5)^{(n-1)}$

Recursive
$a_n = a_{n-1} \cdot r$
$a_n = a_{n-1}(-5)$

$a_5 = a_4(-5)$
$a_5 = 25(-5) = -125$

5) $a_1 = 4$ ×5
$a_2 = 20$ ×5
$a_3 = 100$ ×5
$a_4 = 500$ ×5
$a_5 = 2500$

Explicit
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = 4(5)^{(n-1)}$

Recursive
$a_n = a_{n-1} \cdot r$
$a_n = a_{n-1}(5)$

6) $a_1 = 2$
$a_2 = 8$
start → $a_3 = 32$ ×4
$a_4 = 128$
$a_5 = 512$

Explicit
$a_n = a_1 \cdot r^{(n-1)}$
$a_n = 2(4)^{(n-1)}$

Recursive
$a_n = a_{n-1} \cdot r$
$a_n = a_{n-1}(4)$

7) $a_1 = 3$
$a_2 = 12$ ×4
$a_3 = 48$ ×64
$a_4 = 192$
$a_5 = 768$
$a_6 =$
$a_7 =$
$a_8 = 49{,}152$

$a_n = a_{n-1} \cdot r$
$r = 4$
$a_n = a_{n-1}(4)$ ← recursive

$a_n = a_1 \cdot r^{(n-1)}$
$a_n = 3(4)^{(n-1)}$ explicit

$a_8 = 3(4)^7$
$a_8 = 49152$

8.) $9, \overset{\times(-\frac{1}{3})}{-3}, 1, \ldots$

explicit

$a_n = a_1 \cdot (r)^{(n-1)}$

$a_n = 9(-\frac{1}{3})^{(n-1)}$

use table

$a_1 = 9$

$a_2 = -3$

$a_3 = 1$

$a_4 = -\frac{1}{3}$

$a_5 = \frac{1}{9}$

$a_{12} =$

$a_{12} = -5.0805263 \times 10^{-5}$

$a_{12} = -0.00005263$

9.) explicit $a_n = a_1 + (n-1)d$

$a_n = 6 + (n-1)6$

$a_n = 6 + 6n - 6$

$a_n = 6n$

$a_7 = 6(7) = 42$

11.) $a_n = a_1 \cdot r^{(n-1)}$

$a_n = 2(7)^{(n-1)}$

$a_7 = 2(7)^6$

$a_7 = 235298$

13.) $a_n = a_1 + (n-1)d$

$a_n = -40 + (n-1)15$

$a_n = -40 + 15n - 15$

$a_n = -55 + 15n$

$a_7 = 50$

12.) $a_n = a_1 \cdot r^{(n-1)}$

$a_n = 160(\frac{1}{2})^{(n-1)}$

$a_7 = 160(\frac{1}{2})^6$

$a_7 = 2.5$

14.) $a_n = a_1 \cdot r^{(n-1)}$

$a_n = 7(-3)^{(n-1)}$

$a_7 = 7(-3)^6$

$a_7 = 5103$