Do the following for each sequence:
a) Find the next three terms in each sequence.
b) Tell if the sequence is Arithmetic, Geometric, or Neither.
c) If Arithmetic or Geometric write both a Recursive and an Explict Formula.

1. 26244, 2916, 324, ...$36, 4, \frac{4}{9}$

$\div 9 \quad \div 9$

Geometric

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

recursive
$a_1 = 26,244$

$a_n = a_{n-1} \cdot \frac{1}{9}$

explicit
$a_n = 26244\left(\frac{1}{9}\right)^{n-1}$

2. 9, 10, 18, 45, ... 109 234 450
$+1 \quad +8 \quad +27 \quad +64 \quad +125 \quad +216$

Neither

3. -14, -18, -22, -26, ... $-30, -34, -38$
$-4 \quad -4 \quad -4$

Arithmetic
$d = -4$

recursive
$a_1 = -14$

$a_n = a_{n-1} - 4$

explicit
$a_n = -14 + (n-1)(-4)$

4. Find the missing terms in this Arithmetic Sequence.
$+d \quad +d \quad +d \quad +d \quad +d$
23, $32, 41, 50, 59$, 68

$23 + 5d = 68$
$d = 9$

5. Find the missing terms in this Geometric Sequence.
$\cdot r \quad \cdot r \quad \cdot r \quad \cdot r \quad \cdot r$
8, $12, 18, 27, 40.5$, 60.75

$8 r^5 = 60.75$
$r^5 = 7.59375 \quad r = 1.5$

6. Find the 30th term of each sequence.

a) 3, 6, 12, 24, ...

$$a_n = 3(2)^{n-1}$$

$$r = 2$$

$$a_{30} = 3(2)^{29}$$

$$1,610,612,736$$

b) 7, 1, -5, -11, ...

$$d = -6$$

$$a_n = 7 + (n-1)(-6)$$

$$a_{30} = -167$$

7. Given these two terms of an Arithmetic Sequence find the first term. $a_{17} = 144$ $a_{23} = 186$

$$a_n = a_1 + (n-1)7$$

$$144 = a_1 + (17-1)7$$

$$a_1 = 32$$

$$d = \frac{186-144}{6}$$

$$d = 7$$

8. Given these two terms of an Geometric Sequence find the first term. $a_{13} = 2,125,764$ $a_{18} = 516,560,652$

$$2125764 \cdot r^5 = 516,560,652$$

$$r = 3$$

$$a_n = a_1 (3)^{n-1}$$

$$2,125,764 = a_1 (3)^{13-1}$$

$$a_1 = 4$$