Arithmetic and Geometric Sequences - Worksheet #2

MCR3U Jensen

- **1)** For each arithmetic sequence, determine the values of a and d. Then, write the next four terms.
- **a)** 12, 15, 18, ...

b) $\frac{1}{2}$, 1, $\frac{3}{2}$, ...

2) Given the values of a and d, write the first three terms of the arithmetic sequence. Then, write the formula for the general term.

a)
$$a = 5$$
, $d = 2$

b)
$$a = \frac{3}{4}, d = \frac{1}{2}$$

3) Given the formula for the general term of an arithmetic sequence, determine t_{12} .

a)
$$t_n = 1 - 4n$$

b)
$$t_n = \frac{1}{2}n + \frac{3}{2}$$

4) Which term in the arithmetic sequence 9, 4, -1, ... has the value -146?

5	Determine	the nun	ber of	terms in	each	arithmetic	sea	uence
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a) 38, 36, 34, ... , -20

b) -5, -8, -11, ..., -269

6) Determine a and d and then write the formula for the n^{th} term of each arithmetic sequence with the given terms.

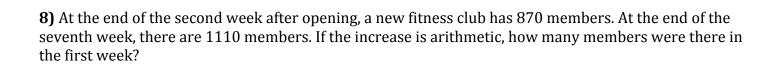
a) $t_{10} = 50$ and $t_{27} = 152$

b) $t_5 = -20$ and $t_{18} = -59$

7) In a lottery, the owner of the first ticket drawn receives $$10\,000$. Each successive winner receives \$500 less than the previous winner.

a) How much does the 10th winner receive?

b) How many winners are there in total?



- **9)** State the common ratio for each geometric sequence and write the next three terms.

- **a)** 1, 2, 4, 8, ... **b)** -3, 9, -27, 81, ... **c)** $\frac{2}{3}$, $-\frac{2}{3}$, $\frac{2}{3}$, $-\frac{2}{3}$, ... **d)** 600, -300, 150, -75, ...

10) For the geometric sequence 54, 18, 6, ... determine the formula for the general term and then find t_9 .

11) Write the first four terms of each geometric sequence.

a)
$$t_n = 5(2)^{n-1}$$

b)
$$a = -1, r = \frac{1}{5}$$

12) Determine the number of terms in the geometric sequence 6, 18, 54, ..., 4374.

13) Which term of the geometric sequence 1, 3, 9, ... has a value of 19 683?

Answers

1) a)
$$a = 12, d = 3; 12, 15, 18, 21, 24, 27, 30 b) $a = \frac{1}{2}, d = \frac{1}{2}; \frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, 3, \frac{7}{2}$$$

2) a) 5, 7, 9;
$$t_n = 5 + (n-1)(2)$$
 b) $\frac{3}{4}, \frac{5}{4}, \frac{7}{4}$; $t_n = \frac{3}{4} + (n-1)(\frac{1}{2})$

3) a) -47 b)
$$\frac{15}{2}$$

4)
$$n = 32$$

6) a)
$$t_n = -4 + (n-1)(6)$$
 b) $t_n = -8 + (n-1)(-3)$

- **7) a)** \$5500 **b)** 20 winners
- **8)** 822 members

9) a)
$$r = 2$$
 b) $r = -3$ **c)** $r = -1$ **d)** $-\frac{1}{2}$

10)
$$\frac{2}{243}$$

11) a) 5, 10, 20, 40 **b)** -1,
$$-\frac{1}{5}$$
, $-\frac{1}{25}$, $-\frac{1}{125}$

- **12)** 7 terms
- **13)** 10th term