# Algebra II   Worksheet #3   Unit 9   Selected Homework Solutions

For a particular arithmetic sequence $a_1 = 5$ and $d = 3$.  Answer the following questions.

3.  What is the explicit formula for the sequence?  $a_n = 3n + 2$

5.  If $a_n = 86$, then what is the value of n?  $3n + 2 = 86 \rightarrow 3n = 84 \rightarrow n = 28$

For a particular geometric sequence  $a_1 = 3$  and  $r = 2$.  Answer the following questions.

8.  What is the explicit formula for this sequence?  $a_n = 3(2)^{n-1}$

9.  What is the $10^{th}$ term in the sequence?  $3(2)^9 = 3(512) = 1536$

Find each of the following.

12.  4 arithmetic means between   1 and 9            They are 2.6, 4.2, 5.8, and 7.4 .

$$1, \underline{\quad}, \underline{\quad}, \underline{\quad}, \underline{\quad}, 9 \qquad 9 = 1 + 5d$$
$$a_1 \qquad\qquad\qquad a_6 \qquad 8 = 5d$$
$$a_6 = a_1 + 5d \qquad\qquad d = 1.6$$

14.  2 geometric means between  2 and 54          They are 6 and 18.

$$2, \underline{\quad}, \underline{\quad}, 54 \qquad 54 = 2r^3$$
$$a_1 \qquad\qquad a_4 \qquad r^3 = 27$$
$$a_4 = a_1 r^3 \qquad\qquad r = 3$$

Solve each of the following problems.

18.  A particular job has a starting salary of $15,000 per year with a guaranteed raise of $340 per year.  What will be the salary for the $15^{th}$ year?     The salary will be $19,760.

| | | |
|---|---|---|
| $a_1 = 15,000$ | Arithmetic Sequence | $a_{15} = a_1 + 14d$ |
| $a_2 = 15,340$ | $a_1 = 15,000$ | $a_{15} = 15,000 + (14)(340)$ |
| $a_3 = 15,680$ | $d = 340$ | $a_{15} = 19,760$ |

19.  A particular job has a starting salary of $15,000 per year with a guaranteed 2% raise per year.  What will be the salary for the $15^{th}$ year?     The salary will be about $19,792.

| | | |
|---|---|---|
| $a_1 = 15,000$ | Geometric Sequence | $a_{15} = a_1 r^{14}$ |
| $a_2 = 15,300$ | $a_1 = 15,000$ | $a_{15} = 15,000(1.02)^{14}$ |
| $a_3 = 15,606$ | $r = 1.02$ | $a_{15} \approx \$19,792.18$ |