1.9 Practice | Using rate of change to find missing terms in an arithmetic sequence
High School Math 1
Mathematics Vision Project

Finding missing terms in an Arithmetic sequence
Each of the models below represents an arithmetic sequence. Find the missing terms in the sequence, showing your method.

1. \[
\begin{array}{ccc}
x & 1 & 2 & 3 \\
y & 3 & 12 & \\
\end{array}
\]

2. \[
\begin{array}{cc}
x & y \\
1 & 2 \\
2 & \\
3 & 26 \\
4 & \\
\end{array}
\]

3. \[
\begin{array}{cc}
x & y \\
1 & 24 \\
2 & \\
3 & 6 \\
4 & \\
\end{array}
\]

4. \[
\begin{array}{cc}
x & y \\
1 & 16 \\
2 & \\
3 & \\
4 & \\
5 & -14 \\
6 & \\
\end{array}
\]

5. \[
\begin{array}{cccccccc}
x & 5 & 8 & 11 & 14 & 17 & 20 \\
y & 10 & & & & 55 & \\
\end{array}
\]

6. (Draw the missing picture patterns)

\[
a_1 = 3 \quad a_2 = \_ \_ \quad a_3 = \_ \_ \quad a_4 = 12
\]

Identifying Sequences
Determine if the given sequence is arithmetic. If the sequence is arithmetic write the recursive and explicit functions. If the sequence is NOT arithmetic, do not write the functions. Assume the first term represents the 1st term, not the 0th term.

7. 5, 9, 13, 17, ...
   Arithmetic? Yes No
   Recursive: ________________________
   Explicit: ________________________

8. 60, 30, 0, -30, ...
   Arithmetic? Yes No
   Recursive: ________________________
   Explicit: ________________________
9. 60, 30, 15, $\frac{15}{2}$, ...

Arithmetic?  Yes  No
Recursive: __________________________
Explicit: __________________________

10. The number of black squares in the picture.

Arithmetic?  Yes  No
Recursive: __________________________
Explicit: __________________________

11. 4, 7, 12, 19, ...

Arithmetic?  Yes  No
Recursive: __________________________
Explicit: __________________________

12. -10, -2, 6, 14, ...

Arithmetic?  Yes  No
Recursive: __________________________
Explicit: __________________________

Given the following recursive or explicit equations, write the next five numbers in the sequence. Use the tables provided to help you keep track of your sequence values.

13. $a_n = a_{n-1} + 9; a_5 = 11$

14. $f(x) = \frac{1}{2}x - 6 \text{ start at } x = 7$

15. $f(x) = -8 - x \text{ start at } x = 17$

16. $a_n = a_{n-1} - 4; a_0 = 3$

Review:
Evaluate the following functions.

$h(x) = 2^x$  
$g(x) = 5 \cdot \left(\frac{1}{2}\right)^x$  
$k(x) = \frac{2}{3} \cdot 3^x$

17. $k(4) =$

18. $h(-2) =$

19. $g(-3) =$

20. $g(4) =$

21. $k(-2) =$

22. $h(-3) =$