More about Arithmetic Sequences

Remember, the explicit formula for an Arithmetic Sequence is: $a_n = a_1 + d(n-1)$

Problems we can solve:

A. Write the explicit formula for the sequence $a = .75, 1, 1.25, 1.50, ...$

$$a_1 = first\ term = .75, \qquad d = common\ difference = 1 - .75 = .25,$$

$$so\ the\ formula\ is\ a_n = .75 + .25(n-1)$$

B. What is the 50th term of an arithmetic sequence whose first term is 7 and has a common difference of 15?

$a_1 = 7$ $d = 15$ $n = 50$

$a_{50} = 7 + 15(50 - 1) = 7 + 15(49) = 7 + 735 = 742$
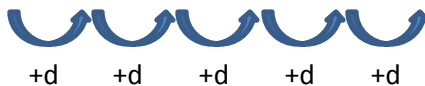
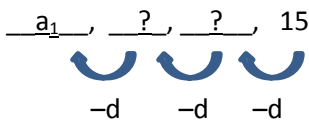C. The number 167 is which number of the sequence, $a_n = 7 + 5(n-1)$?

$$a_n = 167, n = ?$$

$$
\begin{array}{lll}
167 & = & 7 + 5(n-1) \\
-7 & & -7 \\
\hline
160 & = & 5(n-1)
\end{array}
\quad\Rightarrow\quad
\begin{array}{lll}
\dfrac{160}{5} & = & \dfrac{5(n-1)}{5} \\
32 & = & n-1
\end{array}
\quad\Rightarrow\quad
\begin{array}{lll}
32 & = & n-1 \\
+1 & & +1 \\
\hline
33 & = & n
\end{array}
\quad\Rightarrow\quad n = 33
$$

D. Write the explicit formula of the arithmetic sequence with $a_4 = 15$ and $a_9 = 35$

This sequence looks like: __?__, __?__, __?__, 15 , __?__, __?__, __?__, __?__, 35, ...

            +d   +d   +d   +d   +d

$$
So \quad
\begin{array}{lll}
15 + 5d & = & 35 \\
-15 & & -15 \\
\hline
\dfrac{5d}{5} & = & \dfrac{20}{5} \\
d & = & 4
\end{array}
$$

__a_1__, __?__, __?__, 15

    -d   -d   -d

$a_1 = 15 - 3(d) = 15 - 3(4) = 15 - 12 = 3$

So $a_n = 3 + 4(n-1)$