Question#30527

What is the 38th term of the arithmetic sequence where a4 = 8.5 and a7 = 13?

Solution. It is known that the n-th term of an arithmetic progression is given by

$a_n = a_1 + (n-1)d$, where a_1 is the first term and d is the difference. Since $a_4 = a_1 + 3d$,

$a_7 = a_1 + 6d$. Then $a_7 - a_4 = 13 - 8{,}5 = 4{,}5 = 3d$ and so $d = 1{,}5$. It follows that $a_1 = a_4 - 3d = 8{,}5 - 4{,}5 = 4$.

Finally, $a_{38} = a_1 + 37d = 4 + 1{,}5 \cdot 37 = 59{,}5$.

Answer. 59,5.