Additional Problems: Polynomials

**Successive Differences**

1. Find the 1st difference given the second and third term. Second term is 4b + 6; third term is 10b - 2.
2. Find the 1st difference given the second and third term. Second term is 2c + 7; third term is

7c - 1.

1. What are the 2nd differences of the sequence from the following polynomial? $2n^{2}+3n+4$
2. What are the 2nd differences of the sequence from the following polynomial? $3n^{2}+2n+5$
3. Does this sequence, {3, 10, 21, 36}, show that the terms of the 2nd differences are constant?
4. Does this sequence, {-4, 1, 10, 23}, show that the terms of the 2nd differences are constant?
5. Carlos, Maria, and Ethan are finding the 2nd differences for the sequence with the formula $a\_{n}=2n^{2}+4$. Carlos says the 2nd differences are a constant value of 6. Maria says the 2nd differences are a constant value of 4. Ethan says the 2nd differences are a constant value of 8. Is Carlos, Maria, or Ethan correct in finding the 2nd differences? *Solution: Carlos is correct. Maria and Ethan both calculated 1st differences.*
6. Emma, Ava, and Sophia are finding the 2nd differences for the sequence with the formula $a\_{n}=4n^{2}+3n+1$. Emma says the 2nd differences are a constant value of 8. Ava says the 2nd differences are a constant value of 6. Sophia says the 2nd differences are a constant value of 10. Is Emma, Ava, or Sophia correct in finding the 2nd differences? *Solution: Emma is correct. Ava and Sophia both calculated 1st differences.*
7. At which differences does the following polynomial sequence reach a constant value?

 $a\_{n}=n^{3}+5n^{3}+5n^{2}-2n+7 $ *Solution: 3rd differences*

1. At which differences does the following polynomial sequence reach a constant value? $a\_{n}=5n^{4}+3n^{2}-n$ *Solution: 4th differences*