Polynomial Activity

Find the polynomial P with the following properties. If you can, try to find more than one polynomial which can fit the description.

- Polynomial P has 5 terms.

- P is written in descending order.

- Each term of P has 3 variables (x, y, z).

- The degree of the P is 14.

- The degree of the 3rd term is 4 more than the leading coefficient of the 1st term.

- The coefficients of the 2nd and 4th terms multiply to the degree of the 5th term.

- The variable x always has a higher exponent than the variable y in every term.

- The coefficients of P alternate between even and odd.

- The degree of the 2nd term is double the degree of the 5th term.

- The coefficient of the 3rd term is negative.

$$P = 4x^8y^3z^3 + 5x^5y^4z^1 - 6x^5y^2z^1 + x^4yz + 10x^3yz$$