Math 3134
Supplemental Generating Function Problems

Find a closed formula for a_n, the coefficient of x^n.

1. $(x^2 + x^4 + x^6 + x^8 + \cdots)^3$

2. $(1 + x + x^2 + x^3 + \cdots)^3(1 - x^2)$

3. $(x + x^3 + x^5 + x^7 + \cdots)^3(x^2 + x^4 + x^6 + \cdots)$

4. $(x^3 + x^4 + x^5 + \cdots)^4(1 + x + x^2 + x^3)$

5. $(x^3 + x^5 + x^7 + \cdots)^3(x^2 + x^4 + x^6 + \cdots)^2$

6. $(1 + x)(1 + x + x^2)(1 + x + x^2 + x^3 + \cdots)$