Name: _____

Directions: Show all work.

1. [**3 points**] Suppose that $A(x) = \frac{1}{(1-2x)^8}$. What is the coefficient of x^{12} in $A(x)$?

2. [**4 points**] Suppose that $(a_n)_{n \geq 0}$ has OGF $A(x) = \frac{1}{(1-2x)(1-3x)}$. Find a formula for a_n.

3. [**3 points**] Let $a_0 = 2$, $a_1 = 1$, and $a_n = 3a_{n-1} + a_{n-2} + 2^n$ for $n \geq 2$. Find the OGF $A(x)$.