Divided Differences **Math 342**

1. Complete the following table of divided differences.

x	$f(x)$	1st DD	2nd DD	3rd DD
-3	3			
		-2		
-1	-1			
		1		
0	0			
		19		
2	38			

2. Use the previous result to find the interpolating polynomial for the points $(-3, 3)$, $(-1, -1)$, $(0, 0)$, $(2, 38)$ written in any form.

3. Make a table of divided differences to find the interpolating polynomial that passes through $(-1, -6)$, $(1, 0)$, and $(2, 6)$.

4. Write your previous answer as a linear combination of the standard monomial basis polynomials by expanding.

5. Suppose that f is a function with values given in the table below. Use the method of divided differences to find an interpolating polynomial for f.

x	-1	0	1	2	4
$f(x)$	5	3	1	-13	-5