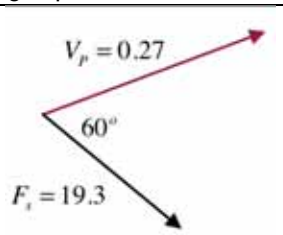
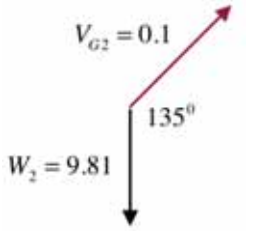
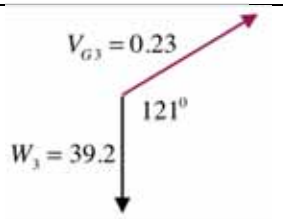
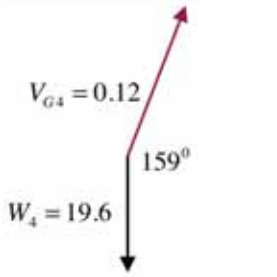
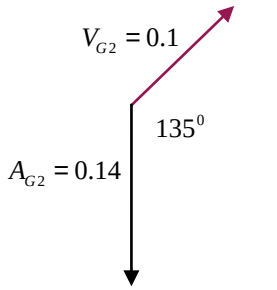
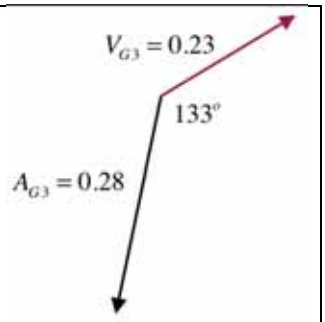
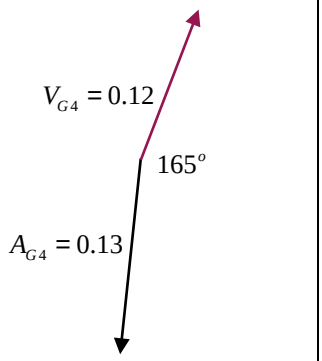
AME 352, Fall 2017, HW-13 Answers

Problem 1

The following solution is based on the velocity and acceleration polygons from Hw-10, or based on an analytical kinematic analysis.

	Vectors in their x-y component	Vectors in graphical form
Spring (L = 0.6428)	Fs = 14.7762 -12.3781 VP = 0.2532 0.0967 FS.VP = 2.5447	
Weights Link 2	W2 = 0 -9.8100 VG2 = 0.0707 0.0707 W2.V2 = -0.6937	
Link 3	W3 = 0 -39.2400 VG3 = 0.1973 0.1190 W3.V3 = -4.6712	
Link 4	W4 = 0 -19.6200 VG4 = 0.0448 0.1118 W4.V4 = -2.1929	
Linear Accelerations Link 2	AG2 = -0.0000 -0.1414 VG2 = 0.0707 0.0707 (A2.V2)m2 = -0.0100	

Link 3	AG3 = -0.0666 -0.2757 VG3 = 0.1973 0.1190 (A3.V3)m3 = -0.1839	
Link 4	AG4 = -0.0143 -0.1333 VG4 = 0.0448 0.1118 (A4.V4)m4 = -0.0311	
Rotational Accelerations Link 2	w2 = -1 a2 = 1 I2.a2.w2 = -0.0100	
Link 3	w3 = -0.3010 a3 = 0.3226 I3.a3.w3 = -0.0039	
Link 4	w4 = -0.3010 a4 = 0.3226 I4.a4.w4 = -0.0049	
Sum of applied forces	lhs = -5.0131	
Sum of inertial forces	rhs = -0.2437	
	-5.0131 – Tx = -0.2437	
Unknown torque	Tx = 4.7694 N.m CW	

Problem 2

The secondary four-bar O_4CDO_6 (dyad) is Grashof.