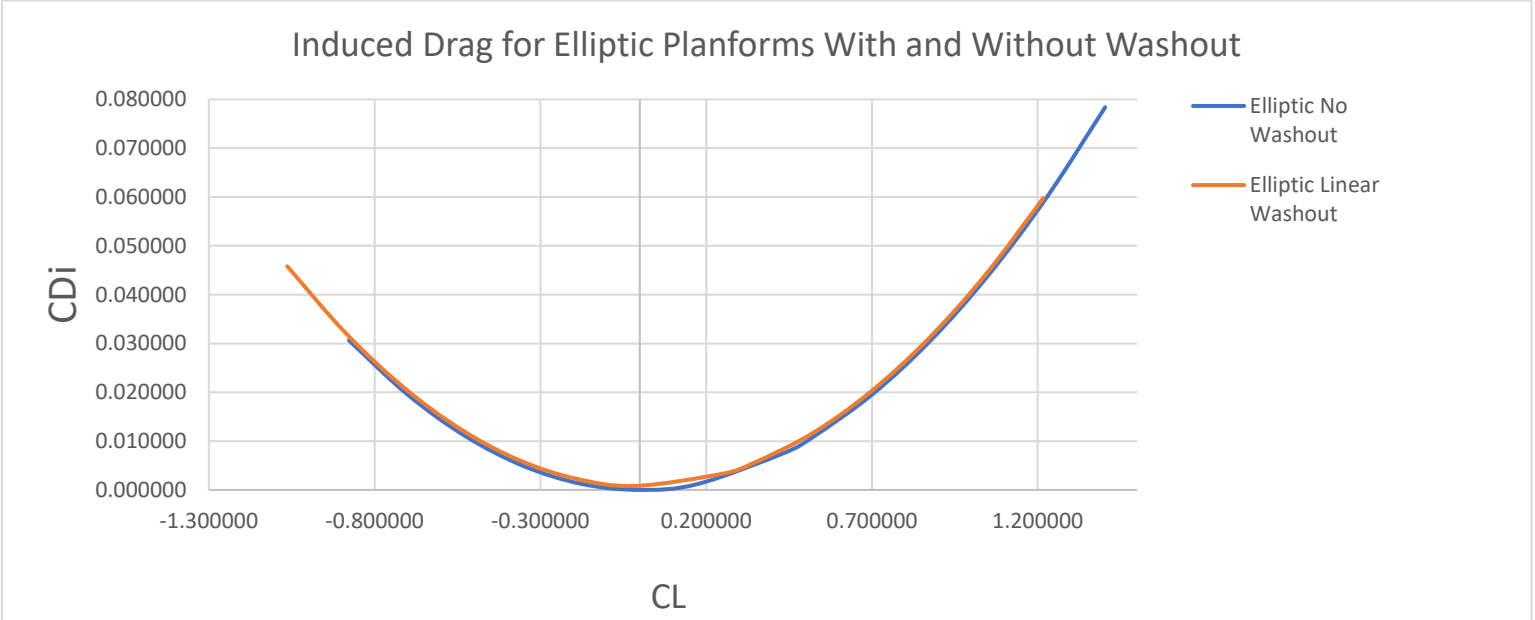
Elliptic, Ra 8, no washout, 50 nodes per semispan		
Alpha values [deg]:	CL values:	CDi values:
-10	-0.877298168986	0.030623743459
-8	-0.701838535189	0.019599195814
-6	-0.526378901391	0.011024547645
-4	-0.350919267594	0.004899798953
-2	-0.175459633797	0.001224949738
0	0.000000000000	0.000000000000
2	0.175459633797	0.001224949738
5	0.438649084493	0.007655935865
6	0.526378901391	0.011024547645
8	0.701838535189	0.019599195814
10	0.877298168986	0.030623743459
12	1.052757802783	0.044098190581
14	1.228217436580	0.060022537180
16	1.403677070377	0.078396783256

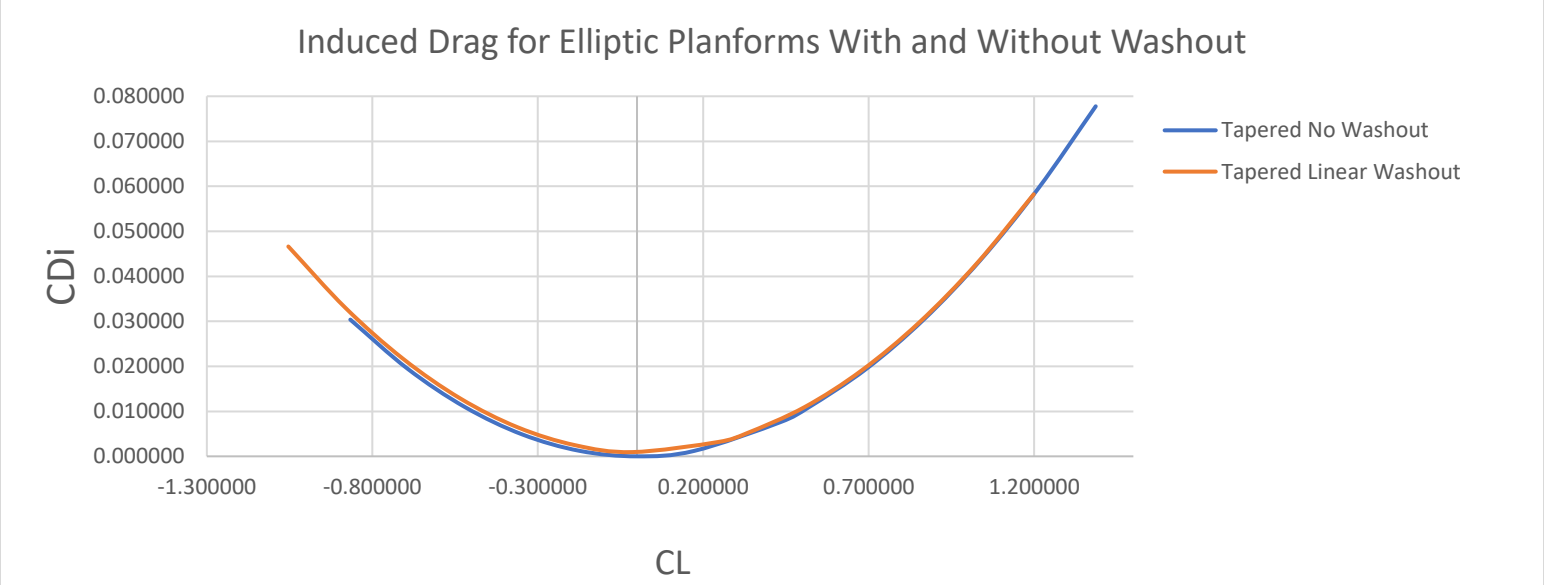
Elliptic, Ra 8, linear washout, 50 nodes per semispan		
Alpha values [deg]:	CL values:	CDi values:
-10	-1.06341878753	0.045814251727
-8	-0.88795915373	0.032190926376
-6	-0.71249951993	0.021017500501
-4	-0.53703988614	0.012293974104
-2	-0.36158025234	0.006020347182
0	-0.18612061854	0.002196619738
2	-0.01066098475	0.000822791771
5	0.252528465946	0.003355611338
6	0.340258282845	0.005424834266
8	0.515717916642	0.011400704728
10	0.691177550439	0.019826474668
12	0.866637184236	0.030702144084
14	1.042096818033	0.044027712977
16	1.217556451830	0.059803181346



As we discussed in class, an elliptic planform is optimum with zero washout. You can see from the graph above that the equations agree with what we talked about. The induced drag is lower at each point for the elliptic planform with no washout than the elliptic planform with a 5-degree linear washout.

Tapered, Ra 8, no washout, 50 nodes per semispan		
Alpha values [deg]:	CL values:	CDi values:
-10	-0.86639059070	0.030380122853
-8	-0.69311247256	0.019443278626
-6	-0.51983435442	0.010936844227
-4	-0.34655623628	0.004860819656
-2	-0.17327811814	0.001215204914
0	0.00000000000	0.000000000000
2	0.173278118140	0.001215204914
5	0.433195295350	0.007595030713
6	0.519834354420	0.010936844227
8	0.693112472560	0.019443278626
10	0.866390590700	0.030380122853
12	1.039668708840	0.043747376908
14	1.212946826980	0.059545040792
16	1.386224945120	0.077773114503

Tapered, Ra 8, linear washout, 50 nodes per semispan		
Alpha values [deg]:	CL values:	CDi values:
-10	-1.05367798679	0.046623377562
-8	-0.88039986865	0.032933688358
-6	-0.70712175051	0.021674408983
-4	-0.53384363237	0.012845539435
-2	-0.36056551423	0.006447079716
0	-0.18728739609	0.002479029825
2	-0.01400927795	0.000941389762
5	0.245907899257	0.003191948095
6	0.332546958327	0.005157339121
8	0.505825076467	0.010910928543
10	0.679103194607	0.019094927793
12	0.852381312747	0.029709336871
14	1.025659430887	0.042754155777
16	1.198937549027	0.058229384512



Interestingly, the tapered wing with no washout performs at a lower induced drag over most angles of attack than the tapered wing with a 5-degree washout. After running the code at 5-degree root angle of attack for a wing with an aspect ratio of 8 and a taper ratio of 0.5, I found that the optimum linear twist was 0.939 degrees. In other words, the 5 -degree washout in this problem is too much.