Lab Report Phyl-03: Dynamics Laws

Student's name Seyedalireza(Arshia) Pakdamanshahri CRN 100831057 Date 2021-11-11

Glider mass 190 ; Hanger mass 5

In the Tables 1 and 2 below, *M* is the mass of the glider with or without extra masses; *m* is the mass of the hanger with any extra masses on it.

Constant Net Force Table 1

Run	*M*, kg	*m*, kg	Total mass, *M*+*m*, kg	Acceleration, experiment a_e, m/s^2	Acceleration, theory a_t, m/s^2	% difference, 100%·$\lvert a_t - a_e \rvert / a_e$
#1	0.190	0.007	0.197	0.3125	0.3482	11.42
#2	0.290	0.007	0.297	1.43	1.327	12.7
#3	0.390	0.007	0.397	0.101	0.173	7.128

Net force, *mg*: 0.0686 (N)

Constant Mass Table 2

Run	*M*, kg	*m*, kg	Net force *mg*, N	Acceleration, experiment a_e, m/s^2	Acceleration, theory a_t, m/s^2	% difference, 100%·$\lvert a_t - a_e \rvert / a_e$
#4	0.21	0.007	0.0686	0.308	0.316	2.597
#5	0.20	0.017	0.1668	0.781	0.764	1.536
#6	0.19	0.027	0.265	1.05	1.22	16.19

Total mass, *M*+*m*: 0.217 (kg)

Linear Momentum, Impulse and Force on Glider Table 3

Run	Force on glider T_e, experiment, N	Force on glider T_t, theory, N	% difference, 100%·$\lvert T_e - T_t \rvert / T_e$
#4	0.065	0.06636	20.9
#5	0.1562	0.1538	1.54
#6	0.2	0.2318	15.9

Compare the ~~force on the~~ glider values in Table 3 with net force values in Table 2

Kinetic and Potential Energy Table 4

Run	Kinetic energy change ΔK, kg·m^2/s^2	Distance Δl, *m*	Work done $W = T_e \Delta l$, kg·m^2/s^2	% difference, 100%·$\lvert \Delta K - W \rvert / \Delta K$
#4	0.009	0.21	0.003	66.6
#5	0.044	0.051	0.002	95.45
#6	0.112	0.021	0.006	99.64

Conclusion: