DATA FOR RANGE OF PROJECTILE

Mass of arrow (kg)	0.107
Drag Force constant	0.0054
Initial Velocity(m/s)	12.8

X-Direction / Y-Direction

TIME(s)	Position (m)	velocity (m/s)	Drag force (N)	Acceleration (m/s2)	Position (m)	velocity (m/s)	Drag force (N)	cceleration (m/s2)
0	0	9.078014184	-0.4450158443	-4.159026582	1.6	9.078014184	-0.4450158443	-13.96902658
0.01	0.09057219051	9.036423919	-0.4409475691	-4.121005318	1.690081691	8.938323919	-0.4409475691	-13.93100532
0.02	0.1807303794	8.995213865	-0.4369349114	-4.083503845	1.778768379	8.799013865	-0.4369349114	-13.89350384
0.03	0.2704783429	8.954378827	-0.432976861	-4.046512719	1.866063843	8.660078827	-0.432976861	-13.85651272
0.04	0.3598198055	8.9139137	-0.4290724302	-4.010022712	1.951971806	8.5215137	-0.4290724302	-13.82002271
0.05	0.4487584414	8.873813473	-0.425220654	-3.974024803	2.036495941	8.383313473	-0.425220654	-13.7840248
0.06	0.5372978749	8.834073225	-0.4214205886	-3.938510174	2.119639875	8.245473225	-0.4214205886	-13.74851017
0.07	0.6254416816	8.794688123	-0.4176713116	-3.903470202	2.201407182	8.107988123	-0.4176713116	-13.7134702
0.08	0.7131933893	8.755653421	-0.4139719209	-3.868896457	2.281801389	7.970853421	-0.4139719209	-13.67889646
0.09	0.8005564787	8.716964456	-0.4103215344	-3.834780695	2.360825979	7.834064456	-0.4103215344	-13.6447807
0.1	0.8875343842	8.678616649	-0.4067192895	-3.801114855	2.438484384	7.697616649	-0.4067192895	-13.61111486
0.11	0.974130495	8.640605501	-0.4031643425	-3.767891051	2.514779995	7.561505501	-0.4031643425	-13.57789105
0.12	1.060348155	8.60292659	-0.399655868	-3.73510157	2.589716155	7.42572659	-0.399655868	-13.54510157
0.13	1.146190666	8.565575575	-0.3961930586	-3.702738865	2.663296166	7.290275575	-0.3961930586	-13.51273887
0.14	1.231661285	8.528548186	-0.3927751245	-3.670795556	2.735523285	7.155148186	-0.3927751245	-13.48079556
0.15	1.316763227	8.49184023	-0.3894012927	-3.639264418	2.806400727	7.02034023	-0.3894012927	-13.44926442
0.16	1.401499666	8.455447586	-0.386070807	-3.608138383	2.875931666	6.885847586	-0.386070807	-13.41813838
0.17	1.485873735	8.419366202	-0.3827829271	-3.577410534	2.944119235	6.751666202	-0.3827829271	-13.38741053
0.18	1.569888527	8.383592097	-0.3795369288	-3.547074101	3.010966527	6.617792097	-0.3795369288	-13.3570741
0.19	1.653547094	8.348121356	-0.3763321029	-3.517122457	3.076476594	6.484221356	-0.3763321029	-13.32712246
0.2	1.736852451	8.312950131	-0.3731677554	-3.487549116	3.140652451	6.350950131	-0.3731677554	-13.29754912
0.21	1.819807575	8.27807464	-0.3700432066	-3.458347726	3.203497075	6.21797464	-0.3700432066	-13.26834773
0.22	1.902415404	8.243491163	-0.3669577914	-3.429512069	3.265013404	6.085291163	-0.3669577914	-13.23951207
0.23	1.98467884	8.209196042	-0.3639108582	-3.401036058	3.32520434	5.952896042	-0.3639108582	-13.21103606
0.24	2.066600749	8.175185682	-0.360901769	-3.372913729	3.384072749	5.820785682	-0.360901769	-13.18291373
0.25	2.14818396	8.141456544	-0.3579298992	-3.345139245	3.44162146	5.688956544	-0.3579298992	-13.15513924
0.26	2.229431269	8.108005152	-0.3549946367	-3.317706885	3.497853269	5.557405152	-0.3549946367	-13.12770689
0.27	2.310345435	8.074828083	-0.3520953823	-3.290611049	3.552770935	5.426128083	-0.3520953823	-13.10061105
0.28	2.390929185	8.041921973	-0.3492315487	-3.263846249	3.606377185	5.295121973	-0.3492315487	-13.07384625
0.29	2.471185212	8.00928351	-0.3464025607	-3.237407109	3.658674712	5.16438351	-0.3464025607	-13.04740711
0.3	2.551116177	7.976909439	-0.3436078547	-3.211288361	3.709666177	5.033909439	-0.3436078547	-13.02128836
0.31	2.630724707	7.944796555	-0.3408468785	-3.185484845	3.759354207	4.903696555	-0.3408468785	-12.99548485
0.32	2.710013398	7.912941707	-0.3381190909	-3.159991504	3.807741398	4.773741707	-0.3381190909	-12.9699915
0.33	2.788984816	7.881341792	-0.3354239616	-3.134803379	3.854830316	4.644041792	-0.3354239616	-12.94480338
0.34	2.867641494	7.849993758	-0.3327609708	-3.109915615	3.900623494	4.514593758	-0.3327609708	-12.91991562
0.35	2.945985935	7.818894602	-0.3301296091	-3.08532345	3.945123435	4.385394602	-0.3301296091	-12.89532345
0.36	3.024020615	7.788041368	-0.327529377	-3.061022215	3.988332615	4.256441368	-0.327529377	-12.87102222
0.37	3.101747978	7.757431145	-0.3249597851	-3.037007337	4.030253478	4.127731145	-0.3249597851	-12.84700734
0.38	3.179170439	7.727061072	-0.3224203532	-3.013274329	4.070888439	3.999261072	-0.3224203532	-12.82327433
0.39	3.256290386	7.696928329	-0.3199106108	-2.989818792	4.110239886	3.871028329	-0.3199106108	-12.79981879
0.4	3.333110178	7.667030141	-0.3174300964	-2.966636415	4.148310178	3.743030141	-0.3174300964	-12.77663641
0.41	3.409632148	7.637363777	-0.3149783575	-2.943722967	4.185101648	3.615263777	-0.3149783575	-12.75372297
0.42	3.4858586	7.607926547	-0.3125549503	-2.921074301	4.2206166	3.487726547	-0.3125549503	-12.7310743
0.43	3.561791811	7.578715804	-0.3101594395	-2.89868635	4.254857311	3.360415804	-0.3101594395	-12.70868635
0.44	3.637434035	7.54972894	-0.3077913982	-2.876555123	4.287826035	3.23332894	-0.3077913982	-12.68655512
0.45	3.712787497	7.520963389	-0.3054504076	-2.854676707	4.319524997	3.106463389	-0.3054504076	-12.66467671
0.46	3.787854397	7.492416622	-0.3031360569	-2.833047261	4.349956397	2.979816622	-0.3031360569	-12.64304726
0.47	3.862636911	7.46408615	-0.3008479431	-2.811663019	4.379122411	2.85338615	-0.3008479431	-12.62166302
0.48	3.937137189	7.435969519	-0.2985856705	-2.790520285	4.407025189	2.727169519	-0.2985856705	-12.60052029
0.49	4.011357358	7.408064316	-0.2963488514	-2.769615433	4.433666858	2.601164316	-0.2963488514	-12.57961543
0.5	4.08529952	7.380368162	-0.2941371047	-2.748944904	4.45904952	2.475368162	-0.2941371047	-12.5589449
0.51	4.158965755	7.352878713	-0.291950057	-2.728505206	4.483175255	2.349778713	-0.291950057	-12.53850521
0.52	4.232358117	7.325593661	-0.2897873414	-2.708292911	4.506046117	2.224393661	-0.2897873414	-12.51829291
0.53	4.305478639	7.298510732	-0.2876485981	-2.688304655	4.527664139	2.099210732	-0.2876485981	-12.49830465
0.54	4.378329331	7.271627685	-0.2855334737	-2.668537137	4.548031331	1.974227685	-0.2855334737	-12.47853714
0.55	4.450912181	7.244942314	-0.2834416213	-2.648987115	4.567149681	1.849442314	-0.2834416213	-12.45898712
0.56	4.523229155	7.218452443	-0.2813727006	-2.629651408	4.585021155	1.724852443	-0.2813727006	-12.43965141
0.57	4.595282196	7.192155929	-0.2793263773	-2.610526891	4.601647696	1.600455929	-0.2793263773	-12.42052689
0.58	4.667073229	7.16605066	-0.2773023231	-2.591610497	4.617031229	1.47625066	-0.2773023231	-12.4016105
0.59	4.738604155	7.140134555	-0.2753002159	-2.572899214	4.631173655	1.352234555	-0.2753002159	-12.38289921
0.6	4.809876856	7.114405563	-0.2733197392	-2.554390086	4.644076856	1.228405563	-0.2733197392	-12.36439009
0.61	4.880893192	7.088861662	-0.2713605822	-2.536080207	4.655742692	1.104761662	-0.2713605822	-12.34608021
0.62	4.951655005	7.06350086	-0.2694224397	-2.517966727	4.666173005	0.9813008599	-0.2694224397	-12.32796673
0.63	5.022164115	7.038321193	-0.2675050121	-2.500046842	4.675369615	0.8580211926	-0.2675050121	-12.31004684
0.64	5.092422325	7.013320724	-0.2656080049	-2.482317803	4.683334325	0.7349207242	-0.2656080049	-12.2923178
0.65	5.162431416	6.988497546	-0.2637311289	-2.464776906	4.690068916	0.6119975462	-0.2637311289	-12.27477691
0.66	5.232193153	6.963849777	-0.2618741001	-2.447421496	4.695575153	0.4892497771	-0.2618741001	-12.2574215
0.67	5.301709279	6.939375562	-0.2600366392	-2.430248965	4.699854779	0.3666755621	-0.2600366392	-12.24024896
0.68	5.370981522	6.915073072	-0.2582184722	-2.41325675	4.702909522	0.2442730725	-0.2582184722	-12.22325675
0.69	5.44001159	6.890940505	-0.2564193296	-2.396442333	4.70474109	0.122040505	-0.2564193296	-12.20644233
0.7	5.508801173	6.866976082	-0.2546389467	-2.37980324	4.705351173	0.0000239183435	-0.2546389467	-12.18980324
0.71	5.577351944	6.843178049	-0.2528770634	-2.363337041	4.704741444	-0.1219219507	-0.2528770634	-12.17333704
0.72	5.645665558	6.819544679	-0.251133424	-2.347041346	4.702913558	-0.2436553212	-0.251133424	-12.15704135
0.73	5.713743652	6.796074265	-0.2494077773	-2.330913806	4.699869152	-0.3652257346	-0.2494077773	-12.14091381
0.74	5.781587849	6.772765127	-0.2476998763	-2.314952115	4.695609849	-0.4866348727	-0.2476998763	-12.12495212
0.75	5.849199753	6.749615606	-0.2460094785	-2.299154005	4.690137253	-0.6078843938	-0.2460094785	-12.109154
0.76	5.916580951	6.726624066	-0.2443363452	-2.283517245	4.683452951	-0.7289759339	-0.2443363452	-12.09351724
0.77	5.983733016	6.703788894	-0.2426802419	-2.268039644	4.675558516	-0.8499111063	-0.2426802419	-12.07803964
0.78	6.050657503	6.681108497	-0.2410409381	-2.252719047	4.666455503	-0.9706915028	-0.2410409381	-12.06271905

0.79	6.117355952	6.658581307	-0.2394182071	-2.237553337	4.656145452	-1.091318693	-0.2394182071	-12.04755334
0.8	6.183829887	6.636205773	-0.2378118262	-2.222540431	4.644629887	-1.211794227	-0.2378118262	-12.03254043
0.81	6.250080818	6.613980369	-0.2362215761	-2.207678282	4.631910318	-1.332119631	-0.2362215761	-12.01767828
0.82	6.316110238	6.591903586	-0.2346472416	-2.192964875	4.617988238	-1.452296414	-0.2346472416	-12.00296487
0.83	6.381919626	6.569973938	-0.2330886107	-2.178398231	4.602865126	-1.572326062	-0.2330886107	-11.98839823
0.84	6.447510445	6.548189955	-0.2315454751	-2.163976403	4.586542445	-1.692210045	-0.2315454751	-11.9739764
0.85	6.512884146	6.526550191	-0.2300176299	-2.149697476	4.569021646	-1.811949809	-0.2300176299	-11.95969748
0.86	6.578042163	6.505053216	-0.2285048737	-2.135559567	4.550304163	-1.931546784	-0.2285048737	-11.94555957
0.87	6.642985917	6.483697621	-0.2270070081	-2.121560824	4.530391417	-2.051002379	-0.2270070081	-11.93156082
0.88	6.707716815	6.462482013	-0.2255238383	-2.107699424	4.509284815	-2.170317987	-0.2255238383	-11.91769942
0.89	6.77223625	6.441405018	-0.2240551725	-2.093973575	4.48698575	-2.289494982	-0.2240551725	-11.90397357
0.9	6.836545602	6.420465283	-0.222600822	-2.080381514	4.463495602	-2.408534717	-0.222600822	-11.89038151
0.91	6.900646236	6.399661467	-0.2211606012	-2.066921507	4.438815736	-2.527438533	-0.2211606012	-11.87676151
0.92	6.964539504	6.378992252	-0.2197343276	-2.053591847	4.412947504	-2.646207748	-0.2197343276	-11.86359185
0.93	7.028226747	6.358456334	-0.2183218215	-2.040390855	4.385892247	-2.764843666	-0.2183218215	-11.85039086
0.94	7.091709291	6.338052425	-0.2169229061	-2.02731688	4.357651291	-2.883347575	-0.2169229061	-11.83731688
0.95	7.154988449	6.317779256	-0.2155374076	-2.014368295	4.328225949	-3.001720744	-0.2155374076	-11.82436829
0.96	7.218065523	6.297635574	-0.2141651546	-2.001543501	4.297617523	-3.119964426	-0.2141651546	-11.8115435
0.97	7.280941802	6.277620139	-0.2128059789	-1.988840924	4.265827302	-3.238079861	-0.2128059789	-11.79884092
0.98	7.343618561	6.257731729	-0.2114597145	-1.976259014	4.232856561	-3.356068271	-0.2114597145	-11.78625901
0.99	7.406097066	6.237969139	-0.2101261985	-1.963796248	4.198706566	-3.473930861	-0.2101261985	-11.77379625
1	7.468378567	6.218331177	-0.2088052702	-1.951451123	4.163378567	-3.591668823	-0.2088052702	-11.76145112
1.01	7.530464306	6.198816665	-0.2074967715	-1.939222163	4.126873806	-3.709283335	-0.2074967715	-11.74922216
1.02	7.592355512	6.179424444	-0.2062005469	-1.927107915	4.089193512	-3.826775556	-0.2062005469	-11.73710791
1.03	7.654053401	6.160153365	-0.2049164432	-1.915106946	4.050338901	-3.944146635	-0.2049164432	-11.72510695
1.04	7.715559179	6.141002295	-0.2036443096	-1.903217847	4.010311179	-4.061397705	-0.2036443096	-11.71321785
1.05	7.776874041	6.121970117	-0.2023839978	-1.891439232	3.969111541	-4.178529883	-0.2023839978	-11.70143923
1.06	7.837999171	6.103055724	-0.2011353615	-1.879769734	3.926741171	-4.295544276	-0.2011353615	-11.68976973
1.07	7.898935739	6.084258027	-0.199898257	-1.868208009	3.883201239	-4.412441973	-0.199898257	-11.67820801
1.08	7.959684909	6.065575947	-0.1986725425	-1.856752733	3.838492909	-4.529224053	-0.1986725425	-11.66675273
1.09	8.020247831	6.04700842	-0.1974580785	-1.845402603	3.792617331	-4.64589158	-0.1974580785	-11.6554026
1.1	8.080625645	6.028554394	-0.1962547276	-1.834156333	3.745575645	-4.762445606	-0.1962547276	-11.64415633
1.11	8.140819481	6.01021283	-0.1950623546	-1.82301266	3.697348981	-4.87888717	-0.1950623546	-11.63301266
1.12	8.200830459	5.991982704	-0.1938808263	-1.811970339	3.647998459	-4.995217296	-0.1938808263	-11.62197034
1.13	8.260659687	5.973863	-0.1927100114	-1.801028144	3.597465187	-5.111437	-0.1927100114	-11.61102814
1.14	8.320308266	5.955852719	-0.1915497807	-1.790184866	3.545770266	-5.227547281	-0.1915497807	-11.60018487
1.15	8.379777284	5.93795087	-0.1904000069	-1.779439317	3.492914784	-5.34354913	-0.1904000069	-11.58943932
1.16	8.439067821	5.920156477	-0.1892605646	-1.768790324	3.438899821	-5.459443523	-0.1892605646	-11.57879032
1.17	8.498180946	5.902468574	-0.1881313304	-1.758236733	3.383726446	-5.575231426	-0.1881313304	-11.56823673
1.18	8.55711772	5.884886206	-0.1870121826	-1.747777407	3.32739572	-5.690913794	-0.1870121826	-11.55777741
1.19	8.615879193	5.867408432	-0.1859030012	-1.737411227	3.269908693	-5.806491568	-0.1859030012	-11.54741123
1.2	8.674466407	5.85003432	-0.1848036684	-1.727137087	3.211266407	-5.92196568	-0.1848036684	-11.53713709
1.21	8.732880393	5.832762949	-0.1837140676	-1.716953902	3.151469893	-6.037337051	-0.1837140676	-11.5269539
1.22	8.791122175	5.81559341	-0.1826340843	-1.7068606	3.090520175	-6.15260659	-0.1826340843	-11.5168606
1.23	8.849192766	5.798524804	-0.1815636055	-1.696856126	3.028418266	-6.267775196	-0.1815636055	-11.50685613
1.24	8.907093171	5.781556243	-0.18050252	-1.686939439	2.965165171	-6.382843757	-0.18050252	-11.49693944
1.25	8.964824387	5.764686849	-0.1794507181	-1.677109515	2.900761887	-6.497813151	-0.1794507181	-11.48710951
1.26	9.0223874	5.747915753	-0.1784080917	-1.667365343	2.8352094	-6.612684247	-0.1784080917	-11.47736534
1.27	9.079783189	5.7312421	-0.1773745344	-1.657705929	2.768508689	-6.7274579	-0.1773745344	-11.46770593
1.28	9.137012725	5.714665041	-0.1763499412	-1.648130292	2.700660725	-6.842134959	-0.1763499412	-11.45813029
1.29	9.194076969	5.698183738	-0.1753342087	-1.638637465	2.631666469	-6.956716262	-0.1753342087	-11.44863746
1.3	9.250976874	5.681797363	-0.1743272349	-1.629226494	2.561526874	-7.071202637	-0.1743272349	-11.43922649
1.31	9.307713386	5.665505098	-0.1733289193	-1.619896442	2.490242886	-7.185594902	-0.1733289193	-11.42989644
1.32	9.364287443	5.649306134	-0.1723391629	-1.610646382	2.417815443	-7.299893866	-0.1723391629	-11.42064638
1.33	9.420699972	5.63319967	-0.171357868	-1.601475402	2.344245472	-7.41410033	-0.171357868	-11.4114754
1.34	9.476951895	5.617184916	-0.1703849385	-1.592382602	2.269533895	-7.528215084	-0.1703849385	-11.4023826
1.35	9.533044125	5.60126109	-0.1694202793	-1.583367096	2.193681625	-7.64223891	-0.1694202793	-11.3933671
1.36	9.588977567	5.585427419	-0.168463797	-1.57442801	2.116689567	-7.756172581	-0.168463797	-11.38442801
1.37	9.64475312	5.569683139	-0.1675153994	-1.565564481	2.03855862	-7.870016861	-0.1675153994	-11.37556448
1.38	9.700371673	5.554027494	-0.1665749956	-1.55677566	1.959289673	-7.983772506	-0.1665749956	-11.36677566
1.39	9.755834109	5.538459737	-0.1656424958	-1.548060709	1.878883609	-8.097440263	-0.1656424958	-11.35806071
1.4	9.811141304	5.52297913	-0.1647178118	-1.539418802	1.797341304	-8.21102087	-0.1647178118	-11.3494188
1.41	9.866294124	5.507584942	-0.1638008562	-1.530849124	1.714663624	-8.324515058	-0.1638008562	-11.34084912
1.42	9.921293431	5.492276451	-0.1628915433	-1.522350872	1.630851431	-8.437923549	-0.1628915433	-11.33235087
1.43	9.976140078	5.477052942	-0.1619897882	-1.513923255	1.545905578	-8.551247058	-0.1619897882	-11.32392325
1.44	10.03083445	5.46191371	-0.1610955074	-1.50556549	1.459826911	-8.66448629	-0.1610955074	-11.31556549
1.45	10.08537877	5.446858055	-0.1602086184	-1.497276808	1.37261627	-8.777641945	-0.1602086184	-11.30727681
1.46	10.13977249	5.431885287	-0.15932904	-1.489056448	1.284274487	-8.890714713	-0.15932904	-11.29905645
1.47	10.19401689	5.416994722	-0.1584566918	-1.480903662	1.194802387	-9.003705278	-0.1584566918	-11.29090366
1.48	10.24811279	5.402185686	-0.157591495	-1.47281771	1.104200789	-9.116614314	-0.157591495	-11.28281771
1.49	10.302061	5.387457509	-0.1567333714	-1.464797864	1.012470505	-9.229442491	-0.1567333714	-11.27479786
1.5	10.35586234	5.37280953	-0.1558822441	-1.456843403	0.9196123399	-9.34219047	-0.1558822441	-11.2668434
1.51	10.40951759	5.358241096	-0.1550380373	-1.448953619	0.825627093	-9.454858904	-0.1550380373	-11.25895362
1.52	10.46302756	5.34375156	-0.154200676	-1.441127813	0.7305155563	-9.56744844	-0.154200676	-11.25112781
1.53	10.51639302	5.329340282	-0.1533700863	-1.433365293	0.6342785155	-9.679959718	-0.1533700863	-11.24336529
1.54	10.56961475	5.315006629	-0.1525461955	-1.425665379	0.5369167501	-9.792393371	-0.1525461955	-11.23566538
1.55	10.62269353	5.300749975	-0.1517289316	-1.418027398	0.4384310331	-9.904750025	-0.1517289316	-11.2280274
1.56	10.67563013	5.286569701	-0.1509182237	-1.410450689	0.3388221315	-10.0170303	-0.1509182237	-11.22045069
1.57	10.72842531	5.272465194	-0.1501140018	-1.402934596	0.238090806	-10.12923481	-0.1501140018	-11.2129346
1.58	10.78107981	5.258435848	-0.1493161969	-1.395478475	0.1362378112	-10.24136415	-0.1493161969	-11.20547848
1.59	**10.8335944**	**5.244481063**	**-0.1485247408**	**-1.388081689**	**0.03326389572**	**-10.35341894**	**-0.1485247408**	**-11.19808169**