

Team members: _____

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Time That Star!

Day 2 Binary Star Data

Summary

Use the following data to perform Epoch Folding to determine the rotation period or the orbital period of the given sources.



Stellar Rotation Data

The following two data sets can tell astronomers how fast a star is rotating.

Cen X-3 Data

These data for Cen X-3 are from EXOSAT satellite's Medium Energy experiment. All data are from 19 June 1985. The time is in seconds from the beginning of that day.

Time (Seconds)	Rate (counts/cm²/s)
0	14.7062277
0.484	14.8695928
0.968	15.8992848
1.452	15.7533336
1.936	16.1208738
2.42	15.66
2.904	16.5468258
3.388	15.211294
3.872	15.5961072
4.356	15.3717151
4.84	14.7062277
5.324	14.8695928
5.808	15.8992848
6.292	15.7533336
6.776	16.1208738
7.26	16.5247452
7.744	16.5468258
8.228	15.211294
8.712	15.5961072
9.196	15.3717151

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GX 301-2 Stellar Rotation DATA

These data for GX 301-2 are from the A2 experiment aboard the HEAO-1 satellite. All data are from 1 February 1978. The time is in seconds from the beginning of that day.

Time (Seconds)	Rate (counts/cm²/s)	Time (Seconds)	Rate (counts/cm²/s)	Time (Seconds)	Rate (counts/cm²/s)
72362.10	0.01388	73027.70	0.01953	73857.14	0.03258
72387.70	0.01512	73053.30	0.01688	73882.74	0.03518
72413.30	0.01593	73099.38	0.02005	73908.34	0.04642
72438.90	0.02347	73145.46	0.02447	73933.95	0.04945
72464.50	0.03103	73171.06	0.03435	73959.54	0.04190
72490.10	0.03113	73196.66	0.03123	73985.14	0.04512
72515.70	0.03387	73222.27	0.04637	74010.74	0.04933
72541.30	0.03270	73247.86	0.04983	74036.34	0.04593
72566.90	0.04195	73273.46	0.04498	74061.95	0.04435
72592.50	0.04873	73299.06	0.04375	74087.54	0.03997
72618.10	0.03942	73324.66	0.03735	74113.14	0.04358
72643.70	0.04453	73350.27	0.03998	74138.74	0.03462
72669.30	0.03557	73375.86	0.03278	74164.34	0.02330
72694.90	0.03318	73401.46	0.03377	74189.95	0.01715
72720.50	0.03347	73427.06	0.02837	74215.54	0.01945
72746.10	0.03520	73452.66	0.02468	74241.14	0.02760
72771.70	0.02420	73478.27	0.01903	74266.74	0.03603
72797.30	0.01890	73503.86	0.01927	74292.34	0.03190
72822.90	0.02057	73590.90	0.03228	74317.95	0.03705
72848.50	0.02873	73677.95	0.03677	74343.54	0.03342
72874.10	0.02737	73703.54	0.02440	74369.14	0.02537
72899.70	0.03315	73729.14	0.01590	74394.74	0.02307
72925.30	0.03692	73754.74	0.02042	74420.34	0.01768
72950.90	0.03377	73780.34	0.01408	74445.95	0.01930
72976.50	0.03375	73805.95	0.01908	74471.54	0.01730
73002.10	0.02500	73831.54	0.02345		

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Orbital Rotation Data

The following two data sets can tell astronomers how fast two stars are orbiting each other.

Cir X-1 Orbital Data

These data for Cir X-1 are from the RXTE Satellite's All Sky Monitor. The time is the number of days from the beginning of the mission.

Time (Days)	Rate (counts/s)	Time (Days)	Rate (counts/s)	Time (Days)	Rate (counts/s)
186.0	93.55	205.0	71.92	224.0	76.04
187.0	105.36	206.0	75.87	225.0	37.82
188.0	97.05	207.0	81.32	226.0	99.55
189.0	85.28	208.0	70.23	227.0	171.93
190.0	88.64	209.0	76.63	228.0	141.79
191.0	88.60	210.0	163.11	229.0	125.30
192.0	60.92	211.0	195.43	230.0	101.67
193.0	121.83	212.0	154.57	231.0	81.85
194.0	170.94	213.0	110.34	232.0	74.14
195.0	177.16	214.0	105.15	233.0	87.63
196.0	113.90	215.0	86.03	234.0	101.00
197.0	82.20	216.0	114.17	235.0	97.89
198.0	97.48	217.0	125.39	236.0	83.97
199.0	120.72	218.0	112.97	237.0	85.34
200.0	109.35	219.0	90.32	238.0	77.82
201.0	75.39	220.0	75.04	239.0	76.74
202.0	71.62	221.0	85.32	240.0	73.02
203.0	70.81	222.0	70.34	241.0	74.61
204.0	63.48	223.0	77.66		

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GX 301-2 Orbital Data

These data for GX 301-2 are from the Vela 5B satellite. The time is the number of days from the beginning of the mission.

Time (Days)	Rate (counts/s)	Time (Days)	Rate (counts/s)
41001.46	5.194	41087.55	4.008
41006.13	1.274	41092.22	0.407
41010.73	1.971	41096.88	0.522
41017.69	1.313	41103.66	0.164
41022.35	1.441	41107.27	0.187
41025.93	0.501	41113.02	0.173
41033.92	1.784	41117.71	0.302
41038.59	0.119	41122.36	10.349
41043.27	11.225	41127.03	1.128
41047.95	1.199	41132.80	0.478
41052.64	0.386	41137.50	0.786
41057.30	0.256	41143.28	1.999
41061.98	2.442	41147.95	1.843
41066.65	0.126	41152.64	1.605
41071.32	1.712	41157.27	0.304
41075.98	0.305	41161.96	5.784
41082.73	7.988	41166.64	5.509