

# 時計算について

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## 1. はじめに

数々の難関中学の問題で使用される時計算について、きになったので調べてみました

## 2. 方法

1秒ごと、1分ごとの長針、短針、秒針のなす角度をすべて調べ上げ、3つの針が1直線上にならぶ時刻を探しました

## 3. 調査

調べたものを表にしました。

n	X	長-短	(長-短)/360
0	30 30/59	2 47/59	0.007768362
1	91 31/59	8 23/59	0.023305085
2	152 32/59	13 58/59	0.038841808
3	213 33/59	19 34/59	0.054378531
4	274 34/59	25 10/59	0.069915254
5	335 35/59	30 45/59	0.085451977
6	396 36/59	36 21/59	0.100988701
7	457 37/59	41 56/59	0.116525424
8	518 38/59	47 32/59	0.132062147
9	579 39/59	53 8/59	0.14759887
10	640 40/59	58 43/59	0.163135593
11	701 41/59	64 19/59	0.178672316
12	762 42/59	69 54/59	0.19420904
13	823 43/59	75 30/59	0.209745763
14	884 44/59	81 6/59	0.225282486
15	945 45/59	86 41/59	0.240819209
16	1006 46/59	92 17/59	0.256355932
17	1067 47/59	97 52/59	0.271892655
18	1128 48/59	103 28/59	0.287429379

1396	85210 10/59	7810 55/59	21.6970339
1397	85271 11/59	7816 31/59	21.71257062
1398	85332 12/59	7822 7/59	21.72810734
1399	85393 13/59	7827 42/59	21.74364407
1400	85454 14/59	7833 18/59	21.75918079
1401	85515 15/59	7838 53/59	21.77471751
1402	85576 16/59	7844 29/59	21.79025424
1403	85637 17/59	7850 5/59	21.80579096
1404	85698 18/59	7855 40/59	21.82132768
1405	85759 19/59	7861 16/59	21.83686441
1406	85820 20/59	7866 51/59	21.85240113
1407	85881 21/59	7872 27/59	21.86793785
1408	85942 22/59	7878 3/59	21.88347458
1409	86003 23/59	7883 38/59	21.8990113
1410	86064 24/59	7889 14/59	21.91454802
1411	86125 25/59	7894 49/59	21.93008475
1412	86186 26/59	7900 25/59	21.94562147
1413	86247 27/59	7906 1/59	21.96115819
1414	86308 28/59	7911 36/59	21.97669492
1415	86369 29/59	7917 12/59	21.99223164
1416	86430 30/59	7922 47/59	22.00776836

n	X	秒-短	(秒-短) / 360
0	30 30/59	182 47/59	0.507768367
1	91 31/59	548 23/59	1.523305087
2	152 32/59	913 58/59	2.538841808
3	213 33/59	1279 34/59	3.554378531
4	274 34/59	1645 10/59	4.569915254
5	335 35/59	2010 45/59	5.585451977
6	396 36/59	2376 21/59	6.600988701
7	457 37/59	2741 56/59	7.616525424
8	518 38/59	3107 32/59	8.632062147
9	579 39/59	3473 8/59	9.647598871
10	640 40/59	3838 43/59	10.663135594
11	701 41/59	4204 19/59	11.678672317
12	762 42/59	4569 54/59	12.694209040
13	823 43/59	4935 30/59	13.709745763
14	884 44/59	5301 6/59	14.725282486

1398	85332 12/59	511282 7/59	1420.228107
1399	85393 13/59	511647 42/59	1421.243644
1400	85454 14/59	512013 18/59	1422.259181
1401	85515 15/59	512378 53/59	1423.274718
1402	85576 16/59	512744 29/59	1424.290254
1403	85637 17/59	513110 5/59	1425.305791
1404	85698 18/59	513475 40/59	1426.321328
1405	85759 19/59	513841 16/59	1427.336864
1406	85820 20/59	514206 51/59	1428.352401
1407	85881 21/59	514572 27/59	1429.367938
1408	85942 22/59	514938 3/59	1430.383475
1409	86003 23/59	515303 38/59	1431.399011
1410	86064 24/59	515669 14/59	1432.414548
1411	86125 25/59	516034 49/59	1433.430085
1412	86186 26/59	516400 25/59	1434.445621
1413	86247 27/59	516766 1/59	1435.461158
1414	86308 28/59	517131 36/59	1436.476695
1415	86369 29/59	517497 12/59	1437.492232
1416	86430 30/59	517862 47/59	1438.507768

n	X	秒-長	(秒-長) / 360
1	5890 10/11	34756 4/11	96.54545455
2	9818 2/11	57927 3/11	160.9090909
3	13745 5/11	81098 2/11	225.2727273
4	17672 8/11	104269 1/11	289.6363636
5	21600	127440	354
6	25527 3/11	150610 10/11	418.3636364
7	29454 6/11	173781 9/11	482.7272727
8	33381 9/11	196952 8/11	547.0909091
9	37309 1/11	220123 7/11	611.4545455
10	41236 4/11	243294 6/11	675.8181818
11	45163 7/11	266465 5/11	740.1818182
12	49090 10/11	289636 4/11	804.5454545
13	53018 2/11	312807 3/11	868.9090909
14	56945 5/11	335978 2/11	933.2727273
15	60872 8/11	359149 1/11	997.6363636
16	64800	382320	1062
17	68727 3/11	405490 10/11	1126.363636
18	72654 6/11	428661 9/11	1190.727273
19	76581 9/11	451832 8/11	1255.090909
20	80509 1/11	475003 7/11	1319.454545
21	84436 4/11	498174 6/11	1383.818182
22	88363 7/11	521345 5/11	1448.181818
23	92290 10/11	544516 4/11	1512.545455
24	96218 2/11	567687 3/11	1576.909091

#### 4. 結果

上の表より、3つの針が1直線上にならぶのは

0時00分00秒、6時00分00秒、

12時00分00秒、18時00分00秒

のときだということがわかりました