

Mathematics Problem of the Week (244)

Correct answers to problem 244 were submitted by:
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Problem 244 solution:

After h hours and m minutes the hour hand has moved through $\frac{h + \frac{m}{60}}{12}$ of a revolution.

At the same time the minute hand has moved through $h + \frac{m}{60}$ revolutions and is located at $\frac{m}{60}$ of a revolution from its starting position.

Thus $\frac{h + \frac{m}{60}}{12} = \frac{m}{60}$ when the hands are in the same location. Solve to obtain $m = \frac{60}{11}h$.

Assume we start at 00:01:00, one minute after midnight.

h	m	time	
1	5.45	1:05:27	5:54 minutes \approx 5 minutes 27 seconds
2	10.91	2:10:54	
3	16.36	3:16:21	
4	21.82	4:21:49	
5	27.27	5:27:16	
6	32.73	6:32:43	
7	38.18	7:38:10	
8	43.64	8:43:38	
9	49.09	9:49:05	
10	54.55	10:54:32	
11	60.00	12:00:00	

Repeat for the next 12 hours. The hands are in the same location 22 times in 24 hours.