

The original problem is below. Since the minute hand moves faster than the hour hand, the angle between them (which starts at 90°) decreases until the hands line up and then the angle begins to increase. At 3:30 the angle between them is less than 90° and at 3:35 the angle is greater than 90° , so we know that the answer is between 3:30 and 3:35. For the hands to form a right angle, the angle between the minute hand and the 6 on the clock must be the same as the angle between the hour hand and the 3 on the clock. Let t be the number of minutes past 3:30. Since the minute hand moves at a rate of 6° per minute, the angle between the minute hand and the 6 on the clock is $6t$. Since the hour hand moves at a rate of $\frac{1}{2}^\circ$ per minute (30° every 60 minutes) the angle between the hour hand and the 3 on the clock is $\frac{1}{2}(t+30)$. Setting these angles equal yields $6t = \frac{1}{2}(t+30)$. So $t = 30/11 = 2 \frac{8}{11}$. Adding this to 3:30 gives 3:32 $\frac{8}{11}$. Converting $\frac{8}{11}$ minutes to seconds gives 3:32:44. Note: like most other problems there are multiple other ways to correctly solve this problem.

Clock Angle

At exactly 3 o'clock the hands on a clock form a right angle. Find the time at which the hands next form a right angle.

Please give your answer in form hours:minutes:seconds with your answer rounded to the nearest second.