Mathematicians' Digital Clock

Enigma n°3

19th December 2024

Here's the translation of the enigma:

A digital clock continuously displays four digits: two for the hours and two for the minutes, in a 24-hour format (from 00:00 to 23:59).

During the Christmas party, mathematicians have agreed that the number four is the best one (because $2 + 2 = 2 \times 2 = 4$). Mathematicians are happy if at least one four appear on the digital clock.

How many minutes a day are mathematicians happy?

I.e.: In a day, for how many minutes does the digit 4 appear at least once on the clock?

Digital clock making mathematicians *very* happy.