Problem of the Week-7: 10/10/10 in Base 12

October 10, 2010 garnered a lot of attention because of its representation as a calendar date by 10/10/10.

Suppose instead we represented a month,day and year in base 12. Base 12 requires 12 digits; we'll call these digits $0-9, X$ and Y. Thus the representation of the year 2010 in base is $11Y6$ because $1 \cdot 12^3 + 1 \cdot 12^2 + 11 \cdot 12^1 + 6 \cdot 12^0 = 2010$.

Determine which year(s), if any, during the 21st century will have a 10/10/10 date when represented in base 12. You must determine how many years in the 21st century have this representation, and determine what those years are.

As always, explain how you obtained your answer.

Posting Date $Y/24/Y6$ (in base 12). Submit solutions to Noah Aydin, Mathematics Department, RBH 319 (e-mail or hard-copy, but hard copy submissions must include name and time of submission) by 4 pm on 12/08/2010 (in base 10).