Activity 2: January 16, 2018 – What is an "AP" date?

Problem Restatement – Is it possible to calculate a maximum number of arithmetic progression dates?

Definitions:

Arithmetic Progression - An arithmetic progression, also known as an arithmetic sequence, is a sequence of n numbers such that the differences between successive terms is a constant d.

Arithmetic Sequence - $a_n = d(n - 1) + c$

What is the smallest arithmetic progression possible?
Can there be a progression of 0, hence using 01/01/01?
There can be, called a "constant series"
Also, the largest arithmetic progression would be on the date 12/31/50

To include every AP date possible, every format for writing dates must be considered
The American way of MM/DD/YY
The European way of DD/MM/YY

Next, can negative years be included as a factor in broadening the possibilities?
Positive years in BC translate to the equal negative in Gregorian Calendar, allowing many more subtraction possibilities

Ex. The year 3 BC translates to MM/DD/-3

My birthdate can therefore be included in the American format

11/03

11/03/-5 – November 3, 5 BC

The earliest date that can be considered is 31/01/-29 or January 31, 29 BC

Before negative years were considered, progressions in the European format were limited to smaller numbers.

12/11/10 – gap of 1
12/07/02 – gap of 5 – largest when only using positive

12/01/-10 – gap of 11 – largest when using negatives as well
Using the American format, how many possibilities are there using a progression of 1?

01/02/03 begins the count
02/03/04
03/04/05
04/05/06
...
12/13/14

There are 12 possible dates using a gap of 1.
After testing for a gap of 2:

01/03/05
...
12/14/16

There are also 12 possible dates using a gap of 2.
When does this stop?
The last possible day would be
12/29/46, as February maxes at 29 (so as to be able to include every month)

RECAP:

Smallest Date Possible: 31/01/-29 (European format)
Largest Date Possible: 01/31/61 (American format)
Largest Difference Including All 12 Months: Progression of 17

Exploring other calendars:

Mayan Calendar has 19 months
According to Mayan legend, the world goes through "Universal Cycles" where the world is created at the start and ends at the conclusion of the cycle.
The current cycle began August 11, 3114 BCE
(or including negatives) 08/11/-3114
and was supposed to end 12/21/2012

The Mayan calendar is 18 months of 20 days (360 days)
Plus one month that is 5 days (= 365 days)