Problem 188: Easter Sunday

Difficulty: Easy

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Problem Background

Easter Sunday is a major religious holiday celebrated by Christian faithful around the world. While the holiday always occurs on a Sunday, the specific date can vary widely from year to year, and even between different countries and denominations of Christianity. The main reason for this is that the date of the holiday is based upon a lunar calendar, generally occurring on the next Sunday after a certain full moon. As a result, the holiday could take place anywhere from late March to late April.

As we said, the actual date on which Easter is observed is largely up to religious authorities, but there are ways to calculate when Easter is expected to take place.

Problem Description

In 1800, mathematician Carl Friedrich Gauss developed an algorithm for exactly this purpose. His algorithm is outlined below:

$$y = the\ year$$
$$a = y\ mod\ 19$$
$$b = y\ mod\ 4$$
$$c = y\ mod\ 7$$
$$k = floor\left(\frac{y}{100}\right)$$
$$p = floor\left(\frac{13 + 8k}{25}\right)$$
$$q = floor\left(\frac{k}{4}\right)$$
$$m = (15 - p + k - q)\ mod\ 30$$
$$n = (4 + k - q)\ mod\ 7$$
$$d = (19a + m)\ mod\ 30$$
$$e = (2b + 4c + 6d + n)\ mod\ 7$$
$$f = (11m + 11)\ mod\ 30$$

After finally calculating d, e, and f, you can use these rules to calculate the actual date:

- Calculate $22 + d + e$ to get the date. If less than or equal to 31, the date is in March. If greater than 31, subtract 31; that is now the date in April.
- If the calculated date is April 25th, $d = 28$, $e = 6$, and $f < 19$, change the date to April 18th instead.

- If the calculated date is April 26th, $d = 29$, and $e = 6$, change the date to April 19th instead.

Given a calendar year, use Gauss's algorithm to calculate the expected date of Easter according to the lunar calendar.

Sample Input

The first line of your program's input, **received from the standard input channel**, will contain a positive integer representing the number of test cases. Each test case will include a single line containing an integer representing a calendar year greater than 1900.

```
3
2021
2022
2019
```

Sample Output

For each test case, your program must print a single line containing the expected date of Easter Sunday according to Gauss's algorithm, in YYYY/MM/DD format.

```
2021/04/04
2022/04/17
2019/04/21
```