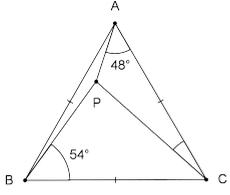


SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1 元旦 A world map is placed on a table. How many points are there such that the map and the real world coincide?	2 廿三 If $\sum_{n=1}^{\infty} \tan^{-1}\left(\frac{k}{n^2}\right) = \frac{3\pi}{4}$, find k .
3 廿四 3 is the smallest odd prime.	4 廿五 Today is the 373 rd birthday of Sir Isaac Newton.	5 廿六 Shortest distance between two circles $x^2 + y^2 = 9$ and $x^2 + y^2 - 12x - 16y + 96 = 0$ is 5.	6 小寒 Today is the 361 st birthday of Jacob Bernoulli.	7 廿八 The number of points and the number of lines in the Fano plane are both 7.	8 廿九 There are 8 positive integers which are less than or equal to 20 and are relatively prime to 20.	9 三十 Every natural number is the sum of at most 9 positive cubes.
10 臘月 There are 10 solutions to n -Queens Problem when $n = 5$.	11 初二 What is the value of $\sqrt{5!+1}$.	12 初三 Do you know that there are 12 types of values of coins and banknotes in Hong Kong?	13 初四 The sum of all non-composite factors of 2016 is 13.	14 初五 A cuboid has sides 1, 2, 3 and its diagonal has length \sqrt{n} . Find n .	15 初六 Do you know that $e^e \approx 15.15$?	16 初七 Let $a = 3$, $b = 5$ and $c = 8$. Find $\frac{a^3}{(a-b)(a-c)} + \frac{b^3}{(b-a)(b-c)} + \frac{c^3}{(c-a)(c-b)}$.
17 初八 Do you know that one must have at least 17 given conditions for a Sudoku puzzle to come up with a unique solution?	 In the figure, find $\angle ACP$.	19 初十 Let a be a root of $x^3 - 4x^2 + 2 = 0$. Find the value of $a^5 - 4a^4 + 7a^3 - 26a^2 + 33$.	20 大寒 Let AC be the diameter of a circle and B be a point on AC . Let D be a point on the circumference so that BD and AC are perpendicular. If $AB = 8$, $BC = 50$, find BD .	21 十二 Let x and y be triangular numbers such that $x - y$ and $x + y$ are also triangular numbers. Find the smallest possible value of x .	22 十三 Let I be the incentre of BAC . If $\angle BIC = 101^\circ$, find the size of $\angle BAC$.	23 十四 Today is the 154 th birthday of David Hilbert.
24 十五 Let $f(x) = x - \frac{1}{x} + 12$. Find the value of $f(2016) + f\left(\frac{1}{2016}\right)$.	25 十六 Today is the 280 th birthday of Joseph Lagrange.	26 十七 A rhombicuboctahedron has 26 faces.	27 十八 27 is the largest powerful number between 1 and 31.	28 十九 In general, a calendar can be reused for every 28 years.	29 二十 29 is the 10 th supersingular prime.	30 廿一 Do you know that $n^5 - n$ is divisible by 30 for all integers n ?
31 廿二 31 is the positive integer closest to $n^5 - n$.	 第五十七屆國際數學奧林匹克 57th International Mathematical Olympiad					

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