SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 廿三 How many integer solutions to $x^a - y^b = 1$ where $x, y, a, b > 1$ are there?	**2** 廿四 Find the value of x for which $x + x = x \times x = x^x$.	**3** 廿五 3 is the only prime that is 1 less than a perfect square.	**4** 立春 Given that the polynomial equation $1 + x + \frac{x^2}{2!} + \cdots + \frac{x^n}{n!} = 0$ is solvable by radicals, find the largest value of n.	**5** 廿七 The number of primes of the form $2^{2^n} + 1$ known so far is 5.	**6** 廿八 6 is a Ramsey number, R(3, 3) = 6.
7 廿九 e Day	**8** 春節 A lucky number in Chinese culture, symbolising "prosperity" (in Chinese, "恭喜發財!").	**9** 年初二 Six recurring nines appear in the decimal places 762 through 767 of π. This is known as the Feynman point.	**10** 年初三 Integer closest to π^2.	**11** 初四 If $(\tan 15°)^3 = a + b\sqrt{3}$, where a and b are integers, find $a + b$.	**12** 初五 There are 12 Latin squares of size 3×3.	**13** 初六 Today is the 211th birthday of Peter Dirichlet.
14 初七 14 is the 4th Catalan number.	**15** 初八 Today is the 452nd birthday of Galileo Galilei.	**16** 初九 Anomalous calculation: $\frac{64}{16} = \frac{4}{1} = 4$.	**17** 初十 Do you know that $n^2 + n + 17$ is a prime for $n = 0, 1, 2, \ldots, 15$!	**18** 十一 Let $f(x) = 3x^3$. Find $f'''(2016)$.	**19** 雨水 19 is the second Cuban prime.	**20** 十三 Let ABC be a triangle, $AB = 25$, $BC = 52$, $CA = 63$. Find the altitude of ABC with respect to the base AC.
21 十四 The sequence 1, 1, 2, 3, 5, 8, 13, 21, ... is defined so that every consecutive 8 terms have the same sum. Find the 2016th term in this sequence.	**22** 十五 There are five numbers. Taking the average of 4 of the numbers at a time, we get 28, 29, 30, 31 and 32. Find the smallest number.	**23** 十六 The smallest number of people needed so that the probability of having 2 people with the same birthday is greater than 0.5.	**24** 十七 Given that rooms A and B are only 6 walking steps away, if you can either take 1, 2, or 3 walking steps a time, how many ways are there to walk from A to B?	**25** 十八 Given $a + b = 10$ and $ab = 32.5$, find $a^3 + b^3$.	**26** 十九 26 is a repdigit in 222_3 and in 22_{12}.	**27** 二十 Four numbers form a geometric sequence. If their sum is 175 and the largest number is 64, find the smallest number.
28 廿一 The price of a product increases by 20% and is then sold with 40% off. If the price is decreased by x % overall, find x.	**29** 廿二 The chance of being born on leap day is about 1 in 1,461.					

57th IMO HONG KONG 2016

第五十七屆國際數學奧林匹克

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