

SUN 日	MON 一	TUE 二	WED 三	THU 四	FRI 五	SAT 六
<div> <div> <div>JANUARY</div> <div>一月 2010</div> </div>  </div> <div> <h3>幾何體建築</h3> <p>在建築設計中，運用抽象的幾何形體加強建築物的雕塑感。以貝聿銘先生設計的香港中銀大廈為例，用一個竹筍形組合幾何體組成，大廈樓高66層，以四個稜柱疊出四節造型。第一節，由1至19層，樓面形狀是完整的正方形；第二節，由20至37層，樓面形狀缺一角，形成五角柱體；第三節，由38至50層，樓面變為三角柱體；最後一節，由51至66層，只剩下一個三角柱體。這座姿態挺拔的建築設計成為數學幾何的典範之一。</p> </div> <div>  <div> 第1-19層 第20-37層 第38-50層 第51-66層 </div> </div>						
<p>Find the number of solutions of the equation $2\cos^2 x + \sin x \cos x + 5\sin^2 x = 2$ for $0 < x < \pi$.</p>	<p>Birthday of Sir Isaac Newton. Lucasian professor of mathematics at Cambridge in 1669. FRS in 1672. Published <i>Principia</i> in 1687. Retired from research in 1693. Warden (1696) then Master (1699) of the Royal Mint. President of the Royal Society from 1703. Knighted in 1705.</p>	<p>Given: $f(x) = x^3 - 3x^2 + 6x - 6$ and $f(a) = 1$, $f(b) = -5$. Find $a + b + 3$.</p>	<p>Find the positive square root of the integral part of $A = \frac{1}{\sqrt{1}} + \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \dots + \frac{1}{\sqrt{361}}$.</p>	<p>Find the magnitude of the position vector of the point (2, 3, 6).</p>	<p>It is given that $DC = 1$ and $AB = 3$. Find $\frac{\text{area of } ABCD}{\text{area of } \triangle CDE}$.</p> 	<p>How many diagonals are there in a hexagon?</p>
<p>Suppose AE is a diameter. ACP is a straight line and PE is a tangent to the circle at E. It is given that the radius of the circle is 7 cm and $\angle CEP = 42^\circ$. Find the length of AC (Correct the answer to the nearest cm).</p> 	<p>In a region, the probability of having a sunny tomorrow is $\frac{49}{50}$ if today is sunny and $\frac{1}{5}$ if today is not sunny. If in a long run about $\frac{1}{n}$ of the days in the region is not sunny, find n.</p>	<p>Solve x if $x + \sqrt{x + \sqrt{x + \sqrt{x + \dots}}} = 16$.</p>	<p>It is known that the cost of shaded area $\triangle ABC$ is \$6.5 per square unit. If a point C is moving along the curve $y = 2x^2 - 8x + 6$, between points A & B, find the greatest cost of shaded area $\triangle ABC$.</p> 	<p>Given that $f(n)$ is a strictly increasing function from natural number into natural number, $f(mn) = f(m)f(n)$ if m, n are relatively prime and $f(180) = 180$. Find the sum of all digits of $f(2327)$.</p>	<p>Given that $x + y + z = 8$, $x, y, z \geq 0$. Find the maximum value of $\sqrt{9x+1} + \sqrt{9y+1} + \sqrt{9z+1}$.</p>	<p>In the figure, if $AB \parallel CE$, find $\angle CAE$ (Correct the answer to the nearest degree).</p> 
<p>The coefficients of x and x^2 in the expansion of $(1 + ax + bx^2)^7$ are 1 and 0 respectively. Find $77a - 98b$.</p>	<p>If $x + \frac{1}{x} = 3$, find $x^3 + \frac{1}{x^3}$.</p>	<p>The vertices of a parallelogram in the Argand diagram are $(-2.5, 3)$, $(2, 3)$, $(5, 7)$, $(0.5, 7)$. Find its perimeter.</p>	<p>一個等比數列的第6項是6!，第5項是5!。求它的第4項。</p>	<p>三小時前，甲乙二人同時由兩地相對而行，甲每小時行5千米，乙每小時行4千米，其間二人相遇後繼續往前行。如今兩人相距6千米，求兩地距離（答案以千米表示）。</p>	<p>If $f(x) = x + 5$ and $g(x) = x^2 - 3$, find $g(f(0))$.</p>	<p>Birthday of David Hilbert. One of the most powerful mathematicians ever, David Hilbert gave a famous list of 23 unsolved problems in 1900. Quantum Theory is formally based on the complex normed vector spaces which are named after him.</p>
<p>在所有少於72的正整數中，共有多少個與72互質（即是除了1，沒有相同的因數）？</p> <p>求8091的最大質因子。（提示：8091 = 8100 - 9）</p>	<p>Birthday of Joseph-Louis Lagrange. Lagrange pioneered the calculus of variation (before Euler gave it that name, in 1766) and applied it to analytical mechanics. He also invented Lagrange multipliers. In 1794, Polytechnique was founded and Lagrange became its first professor of analysis.</p>	<p>Find $\sum_{n=1}^{\infty} \frac{312}{(4n-1)(4n+3)}$.</p>	<p>If the roots of $x^2 - 6x - P = 0$ differ by 12, find P.</p>	<p>If $64(\cos^8 \theta + \sin^8 \theta) = \cos 8\theta + b \cos 4\theta + 35$, find b.</p>	<p>If $2 - x + y$ is a factor of $8 - 8x - 2y + ax^2 + bxy + cy^2$, find $10a + 6b^2 - c$.</p>	<p>Find the remainder when $\prod_{n=1985}^{2014} n$ is divided by 31.</p>

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