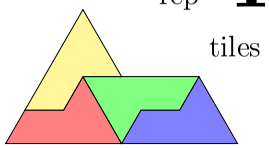
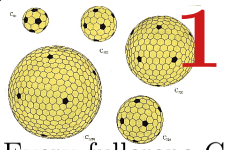
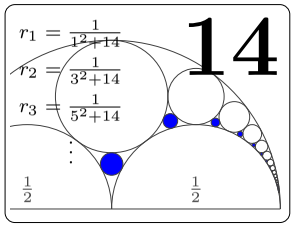
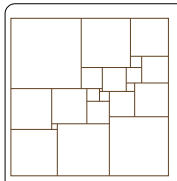
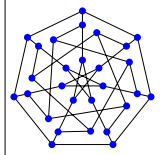
SEOUL ICM 2014

INTERNATIONAL
CONGRESS OF
MATHEMATICIANS

Mathematical Calendar

SUN	MON	TUE	WED	THU	FRI	SAT
29	30	31	**1** • On-line Paper Submission Open	**2** How many twin primes p and $p+2$?	**3** 2333 is the smallest prime having only three 3s.	**4** rep-tiles 
5 $\sec^2(\arctan 2)$	**6** • On-line Registration Open	**7** pandigital expression $98532 \div 14076$	**8** $\infty = \frac{1}{\lim_{x\to 8} \frac{\lvert 8-x\rvert}{8-x}}$	**9** 10999999999 is the smallest prime having only nine 9s.	**10** $1^1 + 2^2 + 3^3 + \cdots + 9^9 + 10^{10}$ is prime.	**11** $\sqrt{37+41+43}$
12  Every fullerene C_n has exactly 12 ⬠.	**13** • Proclamation Ceremony of the year 2014 as the Korean Mathematical Year	**14** 	**15** $\binom{6}{2}$	**16** 2^{2^2}	**17** • Notification of NANUM 2014 Acceptance	**18** $\frac{\csc 18^\circ}{2}$ = golden ratio
19 $19 \mid 181716\ldots321$	**20** $\binom{6}{3}$	**21**  smallest # of squares	**22** $\approx \sqrt{15^2+16^2}$	**23** $\overbrace{11111\ldots11111}^{23}$ is the third repunit prime.	**24** 24! ≈ Avogadro's #	**25** Ramsey # $R(4,5)$
26 26: not palindromic 26^2: palindromic	**27** $1! + 2! + 4!$	**28**  Coxeter's graph	**29** $\approx 5e(\pi-1)$	**30** $2 \times 3 \times 5$	**31** $\approx \frac{e^\pi - \log 3}{\log 2} - \frac{4}{5}$	1
2	3	4				

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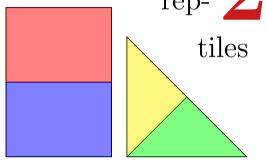
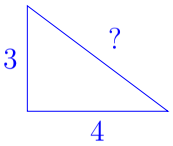
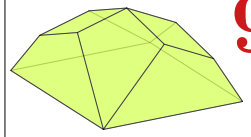
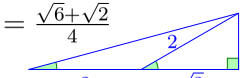
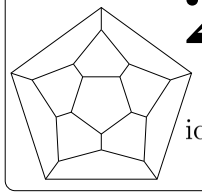
2014.1.

2014.2.

SUN	MON	TUE	WED	THU	FRI	SAT
26	27	28	29	30	31	**1** i^4
2  rep-tiles	**3** Period 3 implies chaos.	**4** $4 \nmid 2014$ The year 2014 is not a leap year.	**5** 	**6** $4 + (4 + 4) \div 4$	**7**  heptagon-shaped 50 pence coin	**8** 888888883 is the smallest prime having only eight 8s.
9  odd # of faces, each face has the same # of edges	**10** 	**11** $\frac{1}{F_{11}} = \frac{1}{89}$ $= 0.01123595\cdots$ $= \sum_{k=0}^{\infty} \frac{F_k}{10^{k+1}}$	**12** $\dfrac{4}{1 - \frac{2}{3}}$	**13** $2 \times 3 \times \cdots \times 13 + 1$ $= 59 \times 509$	**14** $\approx 1 + \pi + \pi^2$	**15** $\cos 15°$ $= \frac{\sqrt{6}+\sqrt{2}}{4}$ 
16 The largest order of $E_{\text{torsion}}(\mathbb{Q})$	**17** $\approx \sqrt[3]{13^3 + 14^3}$	**18** $\approx 4\pi + 2e$	**19** $19\overbrace{22222\ldots2222}^{19}19$ is prime.	**20**  icosian game	**21** $\approx 8e - \frac{2}{e}$	**22** $1^4 + 2^3 + 3^2 + 4^1$
23 $1!$ $+ 2! + 2!$ $+ 3! + 3! + 3!$	**24** $3^3 - 2^2 + 1^1$	**25** $\approx 30e - 18\pi$	**26** Every prime has one of specific 26 primes as a substring.	**27** $27! + 1$ is prime.	**28** • Deadline for Abstract Submission	1
2	3	4				

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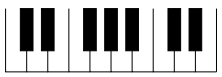
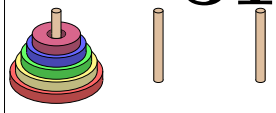
SUN	MON	TUE	WED	THU	FRI	SAT
23	24	25	26	27	28	**1** $-e^{\pi i}$
2 The smallest prime number.	**3** $\lfloor \pi \rfloor$	**4** $\approx \log 55$	**5** There are only 5 Platonic polyhedra.	**6** the smallet perfect number	**7** $M_3 = 2^3 - 1$	**8** $4 + 4 + 4 - 4$
9 $1! + 2! + 3!$	**10** 1010_2	**11** $\sqrt{121} = \sqrt[3]{1331}$	**12** $2^{\frac{1}{12}}$ 	**13** TWO + eleven = TWelve + One	**14** $\pi \approx 3.14$	**15** $2^{15} + 15$ is prime.
16 $\sqrt{10} \approx 3.16$	**17** 17000000000000071 is a 17-digit palindromic prime.	**18** 33_5	**19** XIX	**20** $\approx e^{\pi} - \pi$	**21** $\binom{6+1}{2}$ is the 6th triangular number.	**22** $3 + 19$ $= 5 + 17$ $= 11 + 11$
23 $10^{23} - 23$ is the largest 23 digit prime.	**24** divides $n(n+1)(n+2)(n+3)$	**25** $\sqrt{7^2 + 24^2}$	**26** 26^3 $= 17576$ $= (1+7+5+7+6)^3$	**27** 29 and 29_{29} are both prime.	**28** $\exists$ 28 exotic 7-spheres	**29** 29 and 29_{29} are both prime.
30 33_9	**31**  $2^5 - 1$	1				

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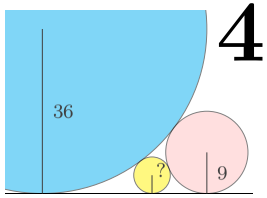
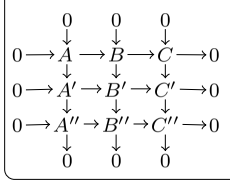
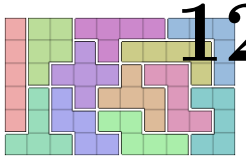
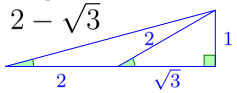
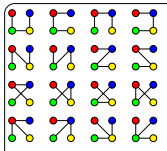
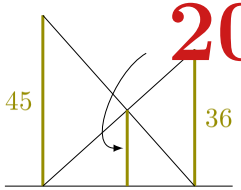
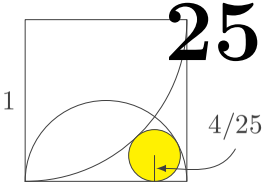
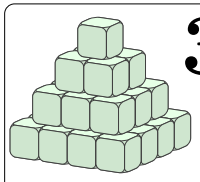
2014.3.

SUN	MON	TUE	WED	THU	FRI	SAT
30	31	**1** $\cos^2\theta + \sin^2\theta$	**2** $\sqrt{2}$ $\approx 1+\frac{24}{60}+\frac{51}{60^2}+\frac{10}{60^3}$	**3** $e < 3 < \pi$	**4** 	**5** S_5 is not solvable.
6 $\frac{\pi^2}{\sum_{n=1}^{\infty}\frac{1}{n^2}}$	**7** $1/7 = 0.142857\ldots$ $5/7 = 0.7142857\ldots$ $4/7 = 0.57142857\ldots$ $6/7 = 0.857142857\ldots$ $2/7 = 0.2857142857\ldots$ $3/7 = 0.42857142857\ldots$	**8** 888 88 8 8 + 8 1000	**9** Nine lemma: 	**10** • Notification of Abstract Acceptance	**11** uəʌəlɔ = eleven	**12**  12 pentominoes
13 $13\,|\,\overbrace{1\ldots13}^{13},\overbrace{13\ldots3}^{13}$	**14**  14-faced dice	**15** $\tan 15^\circ = 2-\sqrt{3}$ 	**16**  # of trees on 4 labeled vertices	**17** minimal # of hints for sudoku puzzle	**18** $3 \times (3+3)$	**19** $4! - 3! + 2! - 1!$
20 	**21**  $1+2+3+4+5+6$	**22** $\approx \frac{39}{\sqrt{\pi}}$	**23** $-1+2\times3\times4$	**24** $24+4\times2 = 2^4+4^2$	**25** 	**26** 222_3
27 x^3+px+q $\rightsquigarrow \Delta = -4p^3-27q^2$	**28** 28^4 $= 614656$ $= \begin{pmatrix} 6+1+4 \\ +6+5+6 \end{pmatrix}^4$	**29** Fibonacci number $F_{29} = 514229$ is a prime ending in 29.	**30**  $1^2+2^2+3^2+4^2$	1	2	3
4	5	6				

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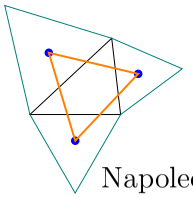
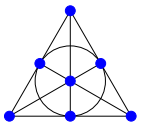
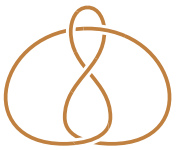
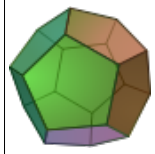
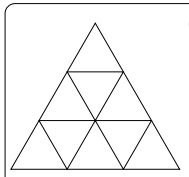
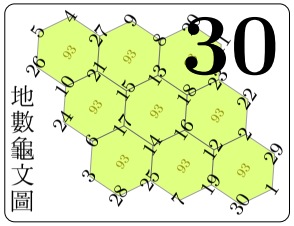
2014.4.

SUN	MON	TUE	WED	THU	FRI	SAT
27	28	29	30	**1** $\lim_{x\to 0}\frac{e^x-1}{x}$	**2** $(S_n : A_n)$	**3**  Napoleon △
4 $a+bi+cj+dk\in\mathbb{H}$ Quaternion	**5** 5 $=0^{1^2}+0^{2^1}$ $+1^{0^2}+1^{2^0}$ $+2^{0^1}+2^{1^0}$	**6** $\sqrt{1+2+\cdots+8}$	**7**  Fano plane	**8**  figure 8 knot	**9** 3^{2^1}	**10** • Deadline for Early Advanced Registration
11 $1_2+11_2+111_2$	**12**  dodecahedron	**13**  How many △s?	**14** $\nexists n : \varphi(n)=14$	**15** 1111_2	**16** $2^4=4^2$	**17** $F_2=2^{2^2}+1$
18 $\approx\frac{133}{e^2}$	**19** $\approx 7e$	**20** $(1\times 2+3)\times 4$	**21** $2^{21}-21$ is prime.	**22** $2^{2^2}+2^2+2$	**23** $\left(\frac{5}{23}\right)=-1$ the smallest quadratic nonresidue modulo 23	**24** $4+4+4\times 4$
$\pi(100)=$ **25** $\pi(25)=9$ $\pi(9)=4$	**26** pandigital expression $\frac{65}{10}\times\frac{948}{237}$	**27** $\approx 5\pi(e-1)$	**28** 28^5 $=17210368$ $=\left(\begin{matrix}1+7+2+1\\+0+3+6+8\end{matrix}\right)^5$	**29** $\approx\frac{170}{\pi+e}$	**30**  地數龜文圖	**31** pandigital expression $\frac{93}{24}\times\frac{856}{107}$
1	2	3				

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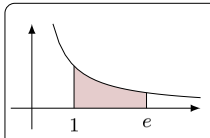
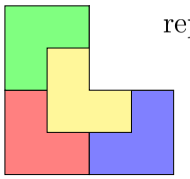
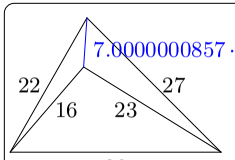
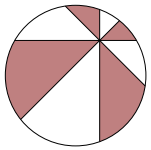
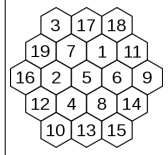
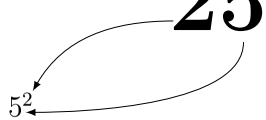
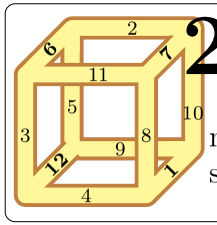
2014.5.

SUN	MON	TUE	WED	THU	FRI	SAT
1  $\int_1^e \frac{1}{x}\,dx$	**2** 223 is the smallest prime having only two 2s.	**3**  nontrivial knot	**4**  rep-4 tiles	**5** $\pi \approx \log_5\left(\begin{matrix}1+1+5\\+5^2+5^3\end{matrix}\right)$	**6**  hexahedron	**7**  Ed Pegg Jr.'s △
8  the same areas	**9** $1\,\text{nano} = 10^{-9}$	**10** $\sqrt{2{+}3{+}5{+}7{+}11{+}13{+}17{+}19{+}23}$	**11** $11\vert\overbrace{100\ldots001}^{2n}$	**12** 12th Fibonacci number is 12^2.	**13** pandigital expression $103428 \div 7956$	**14** $1^2+2^2+3^2$
15 $15\,\vert\,10\cdots05$	**16** $\varepsilon\text{I} \times \angle$	**17** pandigital expression $\frac{68}{10} \times \frac{735}{294}$	**18** $2 \times 3 + 2! \times 3!$	**19**  magic hexagon	**20** $20 + \overbrace{1111\cdots1111}^{20}$ is prime.	**21** pandigital expression $\frac{56}{23} \times \frac{897}{104}$
22 $\approx \sqrt[3]{17^3+18^3}$	**23** $\approx \frac{227}{\pi^2}$	**24** 24! is 24 digits long.	**25**  1st Friedman #	**26**  magic sum	**27** 3^3	**28** $\frac{28!+1}{28+1}$ is a $28+1$ digits prime.
29 $\frac{1}{2}+\frac{1}{3}+\frac{1}{5}+\cdots+\frac{1}{23}+\frac{1}{29}>1$	**30** $\approx 11e$	1	2	3	4	5
6	7	8				

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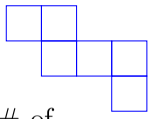
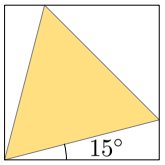
2014.6.

SUN	MON	TUE	WED	THU	FRI	SAT
29	30	**1** $4 \div 4 + 4 - 4$	**2** $\binom{2n}{1} - \binom{2n}{2} + \binom{2n}{3} - \cdots + \binom{2n}{2n-1}$	**3** # of regular tesselations of the plane	**4** $\det A_3 = \det \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$	**5** p: prime $\geq$ $\Rightarrow p^5 \mid \binom{p^2}{p} - \binom{p}{1}$
6 $\approx \log(\pi^4 + \pi^5)$	**7** 111_2	**8** 1 Byte = 8 bits	**9** $\overbrace{111111111}^{9} \div 9 = 12345679$	**10** • Deadline for Advanced Registration	**11**  # of nets for a cube	**12** $\approx \sqrt[3]{9^3 + 10^3}$
13 $1+2+3+\cdots+12+13 = 1^2+2^2+3^2+\cdots+6^2$	**14** $\approx \sqrt{7^2 + 8^2 + 9^2}$	**15**  largest equilateral $\triangle$	**16** $16! = 14!5!2!$	**17** There are 17 plane symmetry groups.	**18** $2 + 3 + 13 = 2 + 5 + 11$	**19** $19 \mid \overbrace{1\ldots19}^{19}, \overbrace{19\ldots9}^{19}$
20 XX	**21** $1_2 \times 11_2 \times 111_2$	**22** $22/7 \approx \pi$	**23** $\overbrace{211111\ldots111113}^{23}$ is prime.	**24** Λ_{24} Leech lattice	**25** $1 + 2 \times 3 \times 4$	**26** $\approx \sqrt{14^2+15^2+16^2}$
27 10000 days $\approx$ 27 years	**28** $(1 + 2 \times 3) \times 4$	**29** $3^{29} - 2^{29}$ is prime.	**30** $\cos 30^\circ = \frac{\sqrt{3}}{2}$	**31** $31^2 \times 325 = 31\overset{2}{\vee}325$	1	2
3	4	5				

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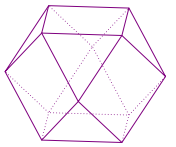
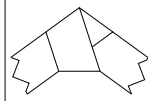
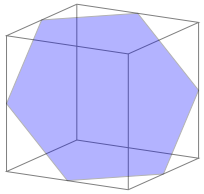
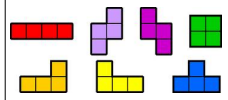
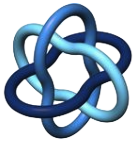
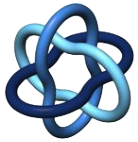
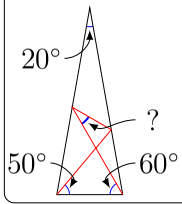
2014.7.

SUN	MON	TUE	WED	THU	FRI	SAT
27	28	29	30	31	**1** 0!	**2**  $V-E+F$
3 $(4+4+4)\div 4$	**4** 44449 is the smallest prime having only four 4s.	**5**  pentagon	**6** 	**7**  # of tetrominoes in TETRIS	**8** $\pi_1(8)=\mathbb{Z}*\mathbb{Z}$	**9** $21-12$ $=32-23$ $=\dots$ $=98-89$
10  • IMU GA 1st day	**11**  • IMU GA 2nd day	**12** • MENAO • Welcome Reception	**13** • Opening Ceremony • Laudation for Prize Winners • Nevanlina Prize Lecture • Public Lecture (James Simons)	**14** • Fields Medalist Lecture 1 • Emmy Noether Lecture 	**15** • Fields Medalist Lecture 2 • Abel Lecture 	**16** • Fields Medalist Lecture 3 • Conference Dinner 
17 • Excursion Day	**18** • Math Education Day • Fields Medalist Lecture 4 	**19** • Math History Day • Gauss Prize Lecture	**20** • Math Popularization Day • Chern Prize Lecture	**21** • Special Invited Lecture (Yitang Zhang) • Closing Ceremony	**22** 2nd Smith number $22=2\times 11$ $2+2=2+(1+1)$	**23** $\pi^{23}\approx 43^7$
24 1 day = 24 hours	**25** 256 and 625 are both squares.	**26** $\frac{2\emptyset}{\emptyset 5}=\frac{2}{5}$	**27** $\approx 7\sqrt{2}+6\sqrt{3}+3\sqrt{5}$	**28** pandigital expression $129780\div 4635$	**29** $\sqrt{20^2+21^2}$	**30** 
31 $\sqrt{14^2}$	1	2				

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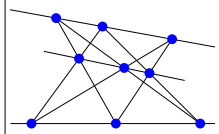
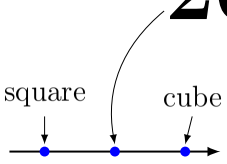
2014.8.

SUN	MON	TUE	WED	THU	FRI	SAT
31	**1** $\frac{a^2}{(a-b)(a-c)} + \frac{b^2}{(b-a)(b-c)} + \frac{c^2}{(c-a)(c-b)}$	**2** $\sqrt{2^{\sqrt{2^{\sqrt{2^{\sqrt{2}}}}}}}\cdots$	**3** triangular number: $1, 3, 6, 10, 15, \ldots$	**4** $1-2+3-4+\cdots = \frac{1}{4}$	**5** $5^4 =$ $2^4+2^4+3^4+4^4+4^4$	**6** əuiu
7 $\sqrt{2^2+3^2+6^2}$	**8** The smallest composite Fibonacci number	**9**  Pappus configuration	**10** 6 weeks = 10! seconds	**11** THREE THREE TWO TWO + ONE ELEVEN doubly true alphametic	**12** 1 year = 12 months	**13** 78910111213 is prime.
14 $\approx 9\tan 1$	**15** $1+2+3+4+5$	**16** $\frac{1\not{0}}{\not{0}4} = \frac{1}{4}$	**17** 2^3+3^2	**18** $\approx \sqrt[46]{1!+2!+\cdots+46!}$	**19** $\frac{1\not{9}}{\not{9}5} = \frac{1}{5}$	 **20** God's # for Rubik's cube
21 $1+(2+3)\times 4$	**22** $\lfloor \pi^e \rfloor$	**23** 23! is pandigital.	**24** p, q: primes > 3 $\Longrightarrow 24 \mid p^2-q^2$	**25** pandigital expression $\frac{68}{13} \times \frac{975}{204}$	**26**  	**27** pandigital expression $102546 \div 3798$ $= 175203 \div 6489$
28 The second perfect number	**29** $\sum_{k=0}^{4} \binom{2k}{k}$	**30** 3^3+3	1	2	3	4
5	6	7				

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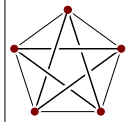
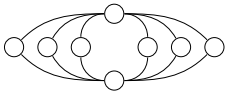
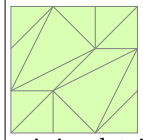
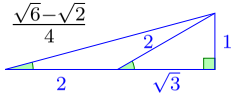
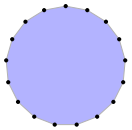
2014.9.

SUN	MON	TUE	WED	THU	FRI	SAT
28	29	30	**1** $0.999999\cdots$	**2** $\frac{1}{1}+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\frac{1}{32}+\cdots$	**3** $F_0 = 2^{2^0}+1$	**4**  tetrahedron
5  K_5 is not planar.	**6** $1+2+3$ $=1\times 2\times 3$	**7** $\approx \sqrt{3^2+4^2+5^2}$	**8**  Quaternion group Q_8	**9** # of topologies on $\{1,2,3\}$	**10** $\left(3-\frac{1}{2}\right)\times 4$	**11** 10000000019 is the smallest $1+0+\cdots+0+1+9$ digits prime.
12 1 ft = 12 in	**13** $(13-1)!+1 \equiv 0 \pmod{13^2}$	**14**  minimal triangulation of a torus	**15** $\sin 15^\circ = \frac{\sqrt{6}-\sqrt{2}}{4}$ 	**16** pandigital expression $150768 \div 9423$	**17**  17-gon is constructible.	**18**  A half of 18 is 10.
19 章法 Metonic cycle	**20** $\approx 37\cos 1$	**21** 10101_2	**22** 22 22 22 $\vdots$ two twos two twos	**23** 23 $=0^5+1^4+2^3$ $+3^2+4^1+5^0$	**24** Every divisor -1 is prime except 1 & 2.	**25** $25^n = \cdots 25$
26 $\sum_{n=1}^{\infty}\frac{n^3}{2^n}$	**27** 33_8	**28** 44_6	**29** $29\,\vert\,\overbrace{2\ldots29}^{29},\overbrace{29\ldots9}^{29}$	**30** pandigital expression $174690 \div 5823$ $= 174960 \div 5832$	**31** 2^2+3^3	1
2	3	4				

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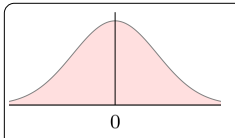
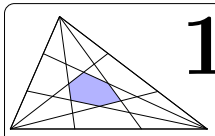
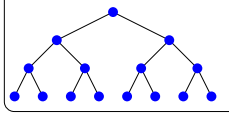
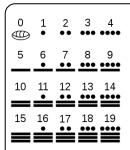
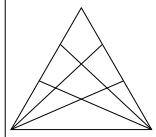
2014.10.

SUN	MON	TUE	WED	THU	FRI	SAT
26	27	28	29	30	31	**1**  $\int_{-\infty}^{\infty} \frac{1}{\sqrt{2\pi}} e^{-\frac{x^2}{2}}\, dx$
2 $\sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}$	**3** $\sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{\cdots}}}}$	**4** num $=\square+\square+\square+\square$	**5** $\coth\left(\log\sqrt{2\sinh(\log 2)}\right)$	**6** $3!$	**7**  tangram	**8** $\frac{10^8-8}{8}$ and $\frac{10^{8+8}-8}{8}$ are both prime.
9 $\coth\left(\log\sqrt{\cosh(\log 2)}\right)$	**10**  Marion's theorem: $\frac{1}{10}$ area	**11** $11+1.1$ $=11\times 1.1$	**12** pandigital expression $107352 \div 8946$	**13** $\sqrt{7+8+9+\cdots+18+19}$	**14** $\frac{1}{4+1}\binom{2\cdot 4}{4}$ is the 4th Catalan number.	**15** 
16 $(-1+2+3)\times 4$	**17** $\approx \sqrt{92\pi}$	**18** $18\,|\,10\cdots 08$	**19** $\frac{1+2+3+\cdots+19}{10}$	**20**  Mayan base-20 numeral system	**21** 111_4	**22** $\approx \frac{19^2}{\pi^4-3^4}$
23 $\approx 9\sqrt[5]{109}$	**24** $4!$	**25** $25! \approx e^{58}$	**26** $\pi - e \approx 11/26$	**27**  How many $\triangle$s?	**28** $\approx 8e+\frac{17}{e}$	**29** $2^2+3^2+4^2$
30 $1\,\text{ft} \approx 30\,\text{cm}$	1	2				

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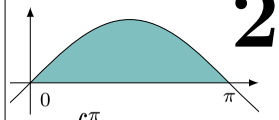
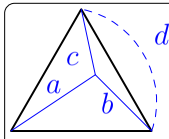
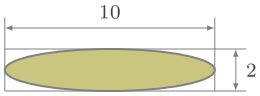
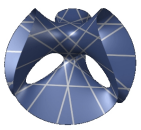
2014.11.

SUN	MON	TUE	WED	THU	FRI	SAT
30	**1** The identity of multiplication	**2**  $\int_0^{\pi} \sin x\,dx$	**3**  $3(a^4+b^4+c^4+d^4)$ $=(a^2+b^2+c^2+d^2)^2$	**4** $2+2=2\times 2$	**5** $\frac{\emptyset 5}{1\emptyset}=5$	**6** $\binom{4}{2}$
7 77767777 is the smallest prime having only seven 7s.	**8** 8^8 is 8 digits long.	**9** 123456789 $\times\,(2,4,5,7,8)$ are pandigital.	**10** $\approx \frac{\pi^{3^2}}{e^{2^3}}$	**11** $\coth\left(\log\sqrt{2\tanh(\log 2)}\right)$	**12** 12th prime is 37. 21st prime is 73.	**13** 78910111213 is prime.
14 $\lfloor 10\sqrt{2} \rfloor$	**15** 4 9 2 3 5 7 8 1 6 magic sum = 15	**16** 1 lb = 16 oz	**17** 3^4-4^3	**18** EIGHTEEN =EIGHLEEN	**19** $\overbrace{11111\ldots11111}^{19}$ is the second repunit prime.	**20** $6\times 20\pm 1$ are both composite.
circumference ≈ **21**  	**22** 22! is 22 digits long.	**23** $\approx 10\log 10$	**24** highly composite number	**25** $1+3+5+7+9$	**26** # of sporadic simple groups	**27**  Cubic surfaces contain 27 lines.
28 $2+3+5+7+11$	**29** $2^{29}=536870912$ all distinct digits	**30** $\sum_{r=0}^{3} r\binom{3}{r}^2$	**31** $-1+2^3\times 4$	1	2	3
4	5	6				

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2014.12.