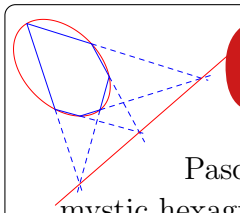
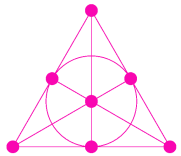
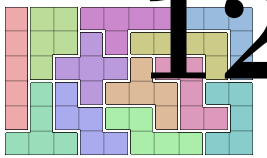
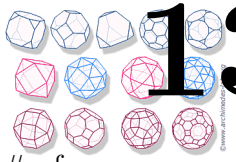
Mathematical Calendar of the year 2013

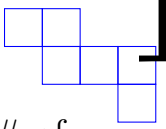
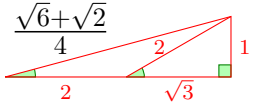
http://pomp.tistory.com/877

SUN	MON	TUE	WED	THU	FRI	SAT
30	31	**1** $\lim_{x\to 0}\frac{\sin x}{x}$	**2** $1+1$	**3** 2333 is the smallest prime having only three 3s.	**4** $\approx \log 55$	**5** $\frac{\not{9}5}{1\not{9}} = 5$
6  Pascal's mystic hexagram	**7**  Fano plane	**8** $4+4+4-4$	**9** $\overbrace{111111111}^{9} \div 9 = 12345679$	**10** $\binom{4+1}{2}$ is the 4th triangular number.	**11** $11 \mid \overbrace{100\ldots001}^{2n}$	**12**  12 pentominoes
13 $2\times3\times\cdots\times13+1 = 59\times509$	**14** $\#\{\overline{A}, A^C, \overline{A}^C, \overline{A^C}, \overline{\overline{A}}, (A^C)^C, \overline{A^C}, \ldots\} \le 14$	**15** $\binom{6}{2}$	**16** pandigital expression $150768 \div 9423$	**17** pandigital expression $\frac{68}{10}\times\frac{735}{294}$	**18** ${}_{\not{F}}\mathcal{E}$	**19** Meton's period
20 $\binom{6}{3}$	**21** Half answer to the ultimate question.	**22** $\approx \sqrt[3]{17^3+18^3}$	**23** $-1+2\times3\times4$	**24** $70^2 = 1^2+2^2+3^2+\cdots+24^2$	**25** 256 and 625 are both squares.	**26** $\sqrt[3]{2} \approx 1.26$
27 $1!+2!+4!$	**28** $\exists$ 28 exotic 7-spheres	**29** $\approx \frac{170}{\pi+e}$	**30** 1 ft $\approx$ 30 cm	**31** $1+2+2^2+2^3+2^4 = 1+5+5^2$	1	2
3	4	5				

2013.1.

SUN	MON	TUE	WED	THU	FRI	SAT
27	28	29	30	31	**1** $\int_0^e \frac{1}{x}\,dx$	**2** The smallest prime number.
3  nontrivial knot	**4** $4 \nmid 2013$ The year 2013 is not a leap year.	**5** 5th Fibonacci number	**6** $\sharp$ Euler squares of order 6	**7** $4+4-4\div 4$	**8** $\begin{array}{r} 888 \\ 88 \\ 8 \\ 8 \\ +\ \ 8 \\ \hline 1000 \end{array}$	**9** 3^{2^1}
10 $\#\left\{\begin{matrix}0,1,2,3,4,\\5,6,7,8,9\end{matrix}\right\}$	**11** $1\overbrace{166666\ldots6666611}$ is prime.	**12** 1 year $=$ 12 months	**13**  # of Archimedean solids	**14** $\frac{1}{4+1}\binom{2\cdot 4}{4}$ is the 4th Catalan number.	**15** $2^{15}+15$ is prime.	**16** $\approx 19\sin 1$
17 minimal # of hints for sudoku puzzle	**18** EIGHTEEN	**19** $\frac{1+2+3+\cdots+19}{10}$	**20** 22_9	**21** $1+(2+3)\times 4$	**22** $\approx 3e^2$	**23** 23! is 23 digits long.
24 $\sqrt{5}\approx 2.24$	**25** $\approx 30e-18\pi$	**26** $\frac{2\not{6}}{\not{6}5}=\frac{2}{5}$	**27** 33_8	**28** The second perfect number	1	2
3	4	5				

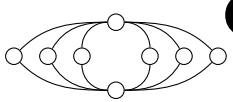
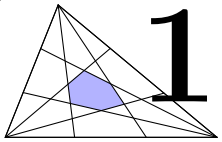
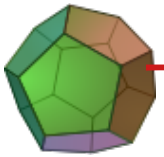
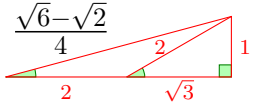
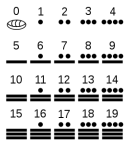
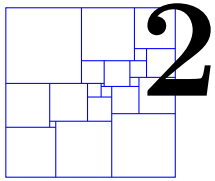
2013.2.

SUN	MON	TUE	WED	THU	FRI	SAT
24	25	26	27	28	**1** $\frac{1}{2\pi i}\int_{\lvert z\rvert=1}\frac{1}{z}\,dz$	**2** $\binom{2n}{1}-\binom{2n}{2}+\binom{2n}{3}-\cdots+\binom{2n}{2n-1}$
3 $\sqrt{1+2\sqrt{1+3\sqrt{1+4\sqrt{\cdots}}}}$	**4** $1-2+3-4+\cdots=\frac{1}{4}$	**5** $2^{2^5}+1=641\times 6700417$	**6** 16666669 is the smallest prime having only six 6s.	**7** $\approx\sqrt{3^2+4^2+5^2}$	**8** 8^8 is 8 digits long.	**9** $1!+2!+3!$
10 $10!=1!3!5!7!$	**11** # of nets for a cube 	**12** # of Latin squares of order 3	**13** $\approx 6e-\frac{9}{e}$	**14** $\pi\approx 3.14$	**15** $\cos 15^\circ=\frac{\sqrt{6}+\sqrt{2}}{4}$ 	**16** $\sqrt{10}\approx 3.16$
17 $\approx\sqrt[3]{13^3+14^3}$	**18** 33_5	**19** # of posets on 1, 2, 3	**20** $\approx 37\cos 1$	**21** $\approx 4\sqrt{\pi^2+1}+\pi+e^2-e$	**22** $3+19=5+17=11+11$	**23** 3^3-2^2
24 $(\mathbb{Z}/24\mathbb{Z})^\times\cong(\mathbb{Z}/2\mathbb{Z})^3$	**25** Shapiro's inequality does not hold for $n\geq 25$.	**26** $26^3=17576=(1+7+5+7+6)^3$	**27** $27^3=19683=(1+9+6+8+3)^3$	**28** pandigital expression $129780\div 4635$	**29** $2^{29}=536870912$ all distinct digits	**30** $3!+4!$
31 $-1+2^3\times 4$	1	2				

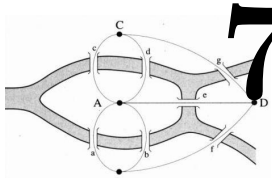
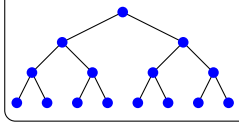
2013.3.

SUN	MON	TUE	WED	THU	FRI	SAT
31	**1** $\tan\frac{\pi}{4}$	**2** 223 is the smallest prime having only two 2s.	**3** triangular number: $1, 3, 6, 10, 15, \ldots$	**4** $\det A_3$ $= \det\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$	**5** $2^{2^1}+1$ is a Fermat prime.	**6** $1+2+3$ $=1\times 2\times 3$
7 pandigital expression $98532 \div 14076$	**8** $\frac{10^8-8}{8}$ and $\frac{10^{8+8}-8}{8}$ are both prime.	**9** $1\,\text{nano} = 10^{-9}$	**10** $\left(3-\frac{1}{2}\right)\times 4$	**11** $1_2+11_2+111_2$	**12** $1\,\text{ft} = 12\,\text{in}$	**13** $1+2+3+\cdots+12+13$ $=1^2+2^2+3^2+\cdots+6^2$
pandigital expression **14** $\frac{57}{12}\times\frac{896}{304}$	**15** $15\mid(1+5)!$	**16** 2^{2^2}	**17** There are 17 plane symmetry groups.	**18** $2+3+13$ $=2+5+11$	**19** $19\mid 181716\ldots321$	**20** $20+\overbrace{1111\cdots1111}$ is prime.
 **21** $1+2+3+4+5+6$	**22** $2^{2^2}+2^2+2$	**23** $23\mid\underbrace{2+3+5+\cdots+83}_{23\text{ primes}}$	**24** $4+4+4\times 4$	**25** $1+3+5+7+9$	**26** $\approx$ $\sqrt{14^2+15^2+16^2}$	**27** $\approx 5\pi(e-1)$
28 $\binom{7+1}{2}$ is the 7th triangular number.	**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				

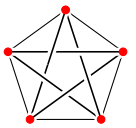
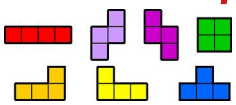
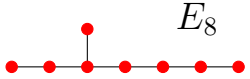
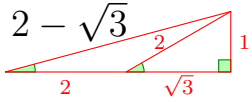
2013.4.

SUN	MON	TUE	WED	THU	FRI	SAT
28	29	30	**1** i^4	**2** $\int_0^\pi \sin x\,dx$	**3** $\lfloor \pi \rfloor$	**4** num $= \square+\square+\square+\square$
5 $\sqrt{.2^{-2}}$	**6** $4 + (4 + 4) \div 4$	**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**  Quaternion group Q_8	**9** 10999999999 is the smallest prime having only nine 9s.	**10**  Marion's theorem: $\frac{1}{10}$ area	**11** 3×4 $\equiv 5 \times 6 \times 7$ $\equiv 1 \pmod{11}$
12  dodecahedron	**13** $(\mathbb{Z}/13\mathbb{Z})^\times = \langle 6 \rangle$	**14** $\approx 5\sqrt{2} + 4\sqrt{3}$	**15** $\sin 15°$ $= \frac{\sqrt{6}-\sqrt{2}}{4}$ 	**16** $(-1 + 2 + 3) \times 4$	**17** $\approx \sqrt{92\pi}$	**18** $\approx$ $\sqrt[46]{1!+2!+\cdots+46!}$
19 $\overbrace{11111\ldots11111}$ is the second repunit prime.	**20**  Mayan base-20 numeral system	**21**  smallest # of squares	**22** $\approx \sqrt{15^2 + 16^2}$	**23** $2\overbrace{11111\ldots111113}$ is prime.	**24** Λ_{24} Leech lattice	**25** $\sum_{r=0}^{2} r \binom{5}{r}$
26 26: not palindromic 26^2: palindromic	**27** $\approx 7\sqrt{2} + 6\sqrt{3} + 3\sqrt{5}$	**28** 44_6	**29** $29 \mid \overbrace{2\ldots29}^{29}, \overbrace{29\ldots9}^{29}$	**30** $\sum_{r=0}^{3} r \binom{3}{r}^2$	**31** $2^2 + 3^3$	1
2	3	4				

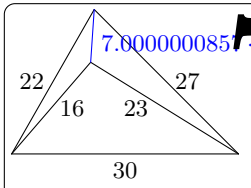
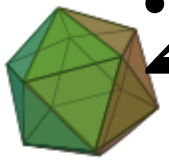
2013.5.

SUN	MON	TUE	WED	THU	FRI	SAT
26	27	28	29	30	31	**1** $\sin\frac{\pi}{2}$
2 $4 \div 4 + 4 \div 4$	**3** # of regular tesselations of the plane	**4** 44449 is the smallest prime having only four 4s.	**5** $5^4 =$ $2^4 + 2^4 + 3^4 + 4^4 + 4^4$	**6** $\sqrt{1 + 2 + \cdots + 8}$	**7**  Königsberg 7 bridges	**8** $\lim_{x \to 8} \frac{1}{\lvert x-8 \rvert} = \infty$
9 123456789 $\times (2, 4, 5, 7, 8)$ are pandigital.	**10** $1^1 + 2^2 + 3^3 + \cdots +$ $9^9 + 10^{10}$ is prime.	**11** ɯǝʌǝlǝ = eleven	**12** 12th prime is 37. 21st prime is 73.	**13** $\sqrt{7 + 8 + 9 + \cdots + 18 + 19}$	**14**  14-faced dice	**15** 
16 $2^4 = 4^2$	**17** $\sqrt{8^2 + 15^2}$	**18** $18^2 - 10 \approx 100\pi$	**19** $19\overbrace{22222\ldots2222}19$ is prime.	**20** XX	pandigital expression **21** $\frac{56}{23} \times \frac{897}{104}$	**22** $\approx \frac{39}{\sqrt{\pi}}$
23 $\left(\frac{5}{23}\right) = -1$ the smallest quadratic nonresidue modulo 23	**24** 24! $\approx$ Avogadro's number	**25** $25 + 2 + 5 = 2^5$	pandigital expression **26** $\frac{65}{10} \times \frac{948}{237}$	pandigital expression **27** $102546 \div 3798$ $= 175203 \div 6489$	**28** $2\pi \approx 6.28$	**29** $7^2 + 8^2$ $+ \cdots + 28^2 + 29^2$ $= 92^2$
30 $1 < k < 30$ $\&\ (k, 30) = 1$ $\Rightarrow k$:prime	1	2				

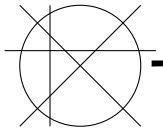
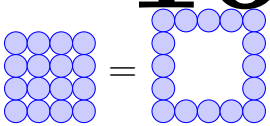
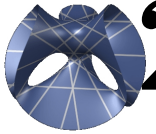
2013.6.

SUN	MON	TUE	WED	THU	FRI	SAT
30	**1** $\lim_{n\to\infty} \sqrt[n]{n}$	**2** The unique even prime number.	**3** $\frac{V_{\text{prism}}}{V_{\text{pyramid}}}$	**4** $2+2=2\times 2$	**5**  K_5 is not planar.	**6** $\binom{4}{2}$
7  # of tetrominoes in TETRIS	**8**  E_8	**9** $4+4+4\div 4$	**10** $1+2+3+4$	**11** $\sqrt{121}=\sqrt[3]{1331}$	**12** 12th Fibonacci number is 12^2.	**13** TWO + eleven = TWelve + One
14 $\approx 1+\pi+\pi^2$	**15** $\tan 15^\circ = 2-\sqrt{3}$ 	**16** $16! = 14!5!2!$	**17** No odd Fibonacci number is divisible by 17.	**18** $2\times 3+2!\times 3!$	**19** $\frac{1\not{9}}{\not{9}5}=\frac{1}{5}$	**20**  God's # for Rubik's cube
21 111_4	**22** $22/7\approx\pi$	**23** 23! is pandigital.	**24** 24! is 24 digits long.	**25** $25!\approx e^{58}$	**26** $\sum_{n=1}^{\infty}\frac{n^3}{2^n}$	**27** 2+3+4+5+6+7
28 28^5 $=17210368$ $=\binom{1+7+2+1}{+0+3+6+8}^5$	**29** 29 and 29_{29} are both prime.	**30** # of distinct dices having faces 1 to 6	**31** $\sqrt{\begin{matrix}3+5+7+11+13\\+17+\cdots+87+89\end{matrix}}$	1	2	3
4	5	6				

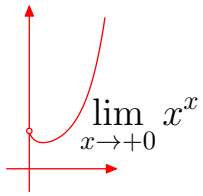
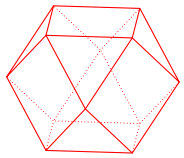
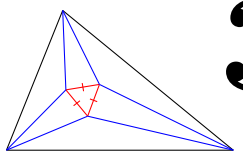
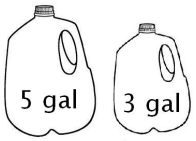
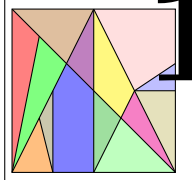
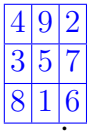
2013.7.

SUN	MON	TUE	WED	THU	FRI	SAT
28	29	30	31	**1** $\log e$	**2** $(S_n : A_n)$	**3** $(4+4+4) \div 4$
4 $a+bi+cj+dk \in \mathbb{H}$ Quaternion	**5** pentagonal number: $1, 5, 12, 22, \ldots$	**6** ${}_{7}\mathcal{E}$	**7**  Ed Pegg Jr.'s $\triangle$	**8** 1 Byte = 8 bits	**9** 3^2	**10** 1010_2
11 $\sqrt{37+41+43}$	**12** $\zeta(-1)$ $= 1+2+3+\cdots$ $= -\frac{1}{12}$	**13** $13 \mid \overbrace{1\ldots13}^{13}, \overbrace{13\ldots3}^{13}$	**14** $\approx \sqrt{7^2+8^2+9^2}$	**15** $1+2+3+4+5$	**16** 1 lb = 16 oz	**17** $17 \mid \overbrace{1\ldots17}^{17}, \overbrace{17\ldots7}^{17}$
18 $\frac{\csc 18^\circ}{2}$ = golden ratio	**19** Every positive integer is the sum of 19 fourth powers.	**20**  icosahedron	**21** 2013 is the 21st century.	**22** $\approx \frac{19^2}{\pi^4 - 3^4}$	**23** 23 $= 0^5 + 1^4 + 2^3$ $+ 3^2 + 4^1 + 5^0$	**24** 1 day = 24 hours
25 Ramsey # $R(4,5)$	**26** $\approx \frac{11}{\pi - e}$	**27** Lander & Parkin $27^5+84^5+110^5+133^5$ $= 144^5$	**28** 28^4 $= 614656$ $= \begin{pmatrix} 6+1+4 \\ +6+5+6 \end{pmatrix}^4$	**29** $\sum_{k=0}^{4} \binom{2k}{k}$	**30** $2 \times 3 \times 5$	**31** $\left\lfloor \frac{100}{\pi} \right\rfloor$
1	2	3				

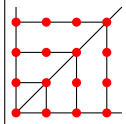
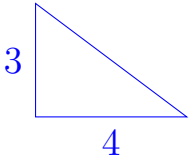
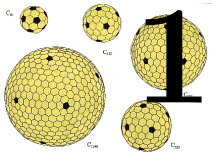
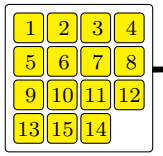
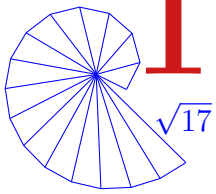
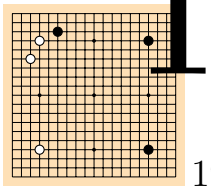
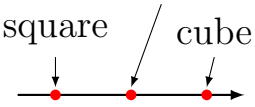
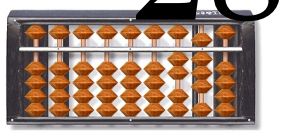
2013.8.

SUN	MON	TUE	WED	THU	FRI	SAT
1 $0.999999\cdots$	**2** $\sqrt{2}^{\sqrt{2}^{\sqrt{2}^{\sqrt{2}^{\cdots}}}}$	**3** $\frac{11+13+15+17+19}{1+3+5+7+9}$	**4** # of colors to color a planar map	**5** $(4\times4+4)\div4$	**6** əuiu	**7** $\coth\left(\log\sqrt{\operatorname{csch}(\log 2)}\right)$
8 ɥɥƃıǝ = eight	**9** # of topologies on $\{1,2,3\}$	**10** $\approx \frac{\pi^{3^2}}{e^{2^3}}$	**11**  11 regions	**12** $2\frac{1}{12}$ 	**13** $2+3+5+7+11+13$ is the 13th prime.	**14** $14+$ (3,5,17,257,65537) are all prime.
15 1111_2	**16** 	**17** $F_2 = 2^{2^2}+1$	**18** $\approx 11\sqrt{e}$	**19** $4!-3!+2!-1!$	**20** $6\times20\pm1$ are both composite.	**21** 10101_2
22 $1^4+2^3+3^2+4^1$	**23** the length of the perfect binary Golay code	**24** $3^3-2^2+1^1$	**25** $1+2\times3\times4$	**26** 2×13	**27**  Cubic surfaces contain 27 lines.	**28** 100 km/h $\approx$ 28 m/s
29 $\sqrt{6!+\frac{6!+6}{6}}$	**30** $\cos 30^\circ = \frac{\sqrt{3}}{2}$	1	2	3	4	5
6	7	8				

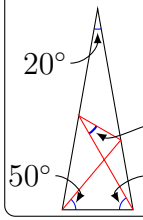
2013.9.

SUN	MON	TUE	WED	THU	FRI	SAT
29	30	1 	2  $V-E+F$	3  Morley's $\triangle$	4  4 gal?	5 $\sec^2(\arctan 2)$
6 $\frac{\sin x}{x} = \mathrm{si}x$	7 $\sqrt{2^2+3^2+6^2}$	8  octahedron	9 Every positive integer is the sum of 9 positive cubes.	10 6 weeks $= 10!$ seconds	11 10000000019 is the smallest $1+0+\cdots+0+1+9$ digits prime.	12  Archimedes' Stomachion
13 $13^2 = 169$ $31^2 = 961$	14 $1^2+2^2+3^2$	15  magic sum $= 15$	16 $\varepsilon\mathrm{I} \times \angle$	17 $3^4 - 4^3$	18  A half of 18 is 10.	19 $\approx 7e$
20 $(1\times 2+3)\times 4$	21 $\sqrt{\varsigma\mathrm{I}\mathrm{Z}}$	22 2nd Smith number $22 = 2\times 11$ $2+2 = 2+(1+1)$	23 $\pi^{23} \approx 43^7$	24 divides $n(n+1)(n+2)(n+3)$	25 $\pi(100) =$ $\pi(25) = 9$ $\pi(9) = 4$	26 # of sporadic simple groups.
27 10000 days $\approx$ 27 years	28 $\approx 8e + \frac{17}{e}$	29 $\sqrt{20^2+21^2}$	30 pandigital expression $174690 \div 5823$ $= 174960 \div 5832$	31 $2^5 - 1$	1	2
3	4	5				

2013.10.

SUN	MON	TUE	WED	THU	FRI	SAT
27	28	29	30	31	**1** $\cos 0$	**2** $\sqrt{2+\sqrt{2+\sqrt{2+\cdots}}}$
3 $1! + 2!$	**4**  square numbers: $1, 4, 9, 16, 25, \ldots$	**5** 	**6** # of domino tilings of a 6×6 square is 6×6.	**7** 77767777 is the smallest prime having only seven 7s.	**8** $\pi_1(8) = \mathbb{Z} * \mathbb{Z}$	**9** $2013 \equiv 2 + 0 + 1 + 3 \pmod 9$
10 $\nexists$ projective plane of order 10	**11** gcd of $1111, 2112, 3113,$ $4114, 5115, 6116,$ $7117, 8118, 9119$	**12**  Every fullerene C_n has exactly 12 ⬠.	**13** $13^2 = 12^2 + 5^2$ $= 12^2 + 4^2 + 3^2$ $= 10^2 + 8^2 + 2^2 + 1^2$	**14** $\nexists n : \varphi(n) = 14$	**15**  Impossible!	**16** $\frac{1\not{0}}{\not{0}4} = \frac{1}{4}$
17 	**18** $3 \times (3 + 3)$	**19**  19×19	**20** $\approx e^{\pi} - \pi$	**21** $1_2 \times 11_2 \times 111_2$	**22** 22! is 22 digits long.	**23** $23 \mid \overbrace{2\ldots23}^{23}, \overbrace{23\ldots3}^{23}$
24 4!	**25** 5^2 1st Friedman #	**26** 	**27** In Collatz sequence, $\underbrace{27 \to 82 \to 41 \to \ldots \to 1}_{112 \text{ numbers}}$	**28** 	**29** $2 \times 5 + 3 \times 3 + 5 \times 2$	**30** 33_9
1	2	3				

2013.11.

SUN	MON	TUE	WED	THU	FRI	SAT
1 $-e^{\pi i}$	**2** $\frac{1}{1}+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$ $+\frac{1}{16}+\frac{1}{32}+\cdots$	**3** $e<3<\pi$	**4** $4+4\times(4-4)$	**5** p: prime ≥ 5 $\Rightarrow p^5 \mid \binom{p^2}{p}-\binom{p}{1}$	**6** $\approx \log(\pi^4+\pi^5)$	**7** 111_2
8 2^3	**9** # of derangements of 4 objects $=4!\left(\frac{1}{2!}-\frac{1}{3!}+\frac{1}{4!}\right)$	**10** 	**11** THREE THREE TWO TWO + ONE ELEVEN doubly true alphametic	**12** $\approx \sqrt[3]{9^3+10^3}$	**13** pandigital expression $103428 \div 7956$	**14** $\left(3+\frac{1}{2}\right)\times 4$
15 # of set partitions of $\{1,2,3,4\}$	**16** # of Boolean operations on P and Q	**17** 2^3+3^2	**18** # of infinite famillies of finite simple groups	**19** XIX	**20** $4\times(4+4\div 4)$	**21** $\approx 8e-\frac{2}{e}$
22 $\lfloor \pi^e \rfloor$	**23** $(2+3)^2-3$	**24** $24+4\times 2$ $=2^4+4^2$	**25** pandigital expression $\frac{68}{13}\times\frac{975}{204}$	**26** 222_3	**27** $\lfloor 10e \rfloor$	**28** $2+3+5+7+11$
29 $2^2+3^2+4^2$	**30**  	**31** $31 \mid \overbrace{3\ldots31}^{31}, \overbrace{31\ldots1}^{31}$	1	2	3	4
5	6	7				

2013.12.