ply_tex2maxima example 21　No.1

(1) $2^3 = 8$

(2) $2^{2^{2^2}} = 65536$

(3) $40\,! = 815915283247897734345611269596115894272000000000$

(4) ${}_{10}\mathrm{P}_3 = 720$

(5) $\dfrac{\dfrac{1}{2} - \dfrac{1}{3}}{\dfrac{1}{2} + \dfrac{1}{3}} = \dfrac{1}{5}$

(6) $-\dfrac{3}{5}a - 0.8a + a \div 5 \times 8 = \dfrac{a}{5}$

(7) $2a^3b^4(x-y)^2(x+y)^2 = 2a^3b^4y^4 - 4a^3b^4x^2y^2 + 2a^3b^4x^4$

(8) $ABC(X+Y+Z)^2 = ABCZ^2 + 2ABCYZ + 2ABCXZ + ABCY^2 + 2ABCXY + ABCX^2$

(9) $\left(\dfrac{1}{2}\alpha + \dfrac{1}{3}\beta + \dfrac{1}{6}\gamma\right)^2 = \dfrac{\beta^2}{9} + \dfrac{\alpha \times \beta}{3} + \dfrac{\gamma \times \beta}{9} + \dfrac{\alpha^2}{4} + \dfrac{\gamma \times \alpha}{6} + \dfrac{\gamma^2}{36}$

(10) ${}_3\mathrm{C}_0\ a^3 + {}_3\mathrm{C}_1\ a^2b + {}_3\mathrm{C}_2\ ab^2 + {}_3\mathrm{C}_3\ b^3 = (b+a)^3$

(11) $a^3 + b^3 + c^3 - 3abc = (c+b+a)\left(c^2 - bc - ac + b^2 - ab + a^2\right)$

(12) $(x+y)(y+z)(z+x) + xyz = (z+y+x)(yz + xz + xy)$

(13) $\dfrac{\sqrt{2}-1}{\sqrt{6}+\sqrt{3}} = \dfrac{\left(\sqrt{2}-1\right)\sqrt{6} + \left(-\sqrt{2}+1\right)\sqrt{3}}{3}$

(14) $\sqrt{\ 10 - 2\sqrt{21}\ } = \sqrt{7} - \sqrt{3}$

(15) $\sqrt[5]{\sqrt[3]{14348907}\ } = 3$

(16) $\sqrt{7} \times \sqrt[3]{7} \times \sqrt[6]{7} = 7$

(17) $|\ |3-\pi| - 1\ | = 4 - \pi$

(18) $(1+i)^3 = 2i - 2$

(19) $e^{\pi i} = -1$

(20) $\sin\dfrac{5}{4}\pi\ \cos\dfrac{5}{6}\pi\ \tan\dfrac{5}{3}\pi = -\dfrac{3}{2^{\frac{3}{2}}}$

(21) $\sin^2\dfrac{5}{4}\pi + \cos^2\dfrac{5}{6}\pi + \tan^2\dfrac{5}{3}\pi = \dfrac{17}{4}$

ply_tex2maxima example 21 No.2

(22) $\log e^5 = 5$

(23) $\log_2 4^3 = 6$

(24) $\dfrac{d}{dx}(x^2 \sin \pi x) = 2x \sin(\pi x) + \pi x^2 \cos(\pi x)$

(25) $\dfrac{d}{dx}\ (\log(\log x)) = \dfrac{1}{x \log x}$

(26) $\dfrac{d}{dx}\ \log_{x+1} 3 = -\dfrac{\log 3}{(x+1)(\log(x+1))^2}$

(27) $\dfrac{d}{dx}\ e^{ex} = e^{ex+1}$

(28) $\displaystyle\int \theta \cos\theta^2\, d\theta = \frac{\sin\theta^2}{2} + C$

(29) $\displaystyle\int t^2 \log t\, dt = \frac{t^3(3\log t - 1)}{9} + C$

(30) $\displaystyle\int_1^{\frac{5}{2}} (x-1)(2x-5)^2\, dx = \frac{27}{16}$

(31) $\displaystyle\sum_{k=1}^{n} k(k+1)^2 = \frac{n(n+1)(n+2)(3n+5)}{12}$

(32) $\displaystyle\lim_{x\to-\infty} (\sqrt{x^2+3x} + x) = -\frac{3}{2}$

(33) $a_{n+1} = 3a_n + 12,\quad a_1 = \frac{1}{2}$ solution: $a(n) = \dfrac{13\,3^n - 36}{6}$

(34) $a_{n+2} = 12a_{n+1} - 35a_n,\quad a_1 = 2,\ a_2 = 24$ solution: $a(n) = 7^n - 5^n$

(35) $2x^2 + 3x + 4 = 0$ solution: $\left[x = -\dfrac{\sqrt{23}i + 3}{4}, x = \dfrac{\sqrt{23}i - 3}{4}\right]$

(36) $x^2 - 3x - 4 \leqq 0$ solution: $[x = -1]$ *or* $[x = 4]$ *or* $[-1 < x, x < 4]$

(37) $x^3 - 2x^2 - 5x + 6 \geqq 0$ solution: $[x = -2]$ *or* $[x = 1]$ *or* $[x = 3]$ *or* $[3 < x]$ *or* $[-2 < x, x < 1]$

(38) $-x^2 - x^2 = -2x^2$

(39) $\left\{\dfrac{1}{2}a - \left(\dfrac{1}{3}b - \dfrac{1}{4}c\right)\right\}^2 = \dfrac{c^2}{16} - \dfrac{bc}{6} + \dfrac{ac}{4} + \dfrac{b^2}{9} - \dfrac{ab}{3} + \dfrac{a^2}{4}$