

# ply\_tex2maxima example3 No.1

$$(1) \quad 2^3 = 8$$

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

$$(3) \quad 40! = 815915283247897734345611269596115894272000000000$$

$$(4) \quad {}_{10}P_3 = 720$$

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

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

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

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

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

$$(10) \quad {}_3C_0 a^3 + {}_3C_1 a^2b + {}_3C_2 ab^2 + {}_3C_3 b^3 = (b+a)^3$$

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

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

$$(13) \quad \frac{\sqrt{2}-1}{\sqrt{6}+\sqrt{3}} = \frac{(\sqrt{2}-1)\sqrt{6} + (-\sqrt{2}+1)\sqrt{3}}{3}$$

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

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

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

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

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

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

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

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

## ply\_tex2maxima example3 No.2

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

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

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

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

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

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

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

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

$$(30) \quad \int_1^3 (x-1)(x-3)^2 dx = \frac{4}{3}$$

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

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

$$(33) \quad a_{n+1} = 3a_n + 12, \quad a_1 = \frac{1}{2}$$

$$\text{solution: } a(n) = \frac{13 \cdot 3^n - 36}{6}$$

$$(34) \quad a_{n+2} = 12a_{n+1} - 35a_n, \quad a_1 = 2, \quad a_2 = 24$$

$$\text{solution: } a(n) = 7^n - 5^n$$

$$(35) \quad 2x^2 + 3x + 4 = 0$$

$$\text{solution: } \left[ x = -\frac{\sqrt{23}i + 3}{4}, x = \frac{\sqrt{23}i - 3}{4} \right]$$

$$(36) \quad x^2 - 3x - 4 \leq 0$$

$$\text{solution: } [x = -1] \text{ or } [x = 4] \text{ or } [-1 < x, x < 4]$$

$$(37) \quad x^3 - 2x^2 - 5x + 6 \geq 0 \quad \text{solution: } [x = -2] \text{ or } [x = 1] \text{ or } [x = 3] \text{ or } [3 < x] \text{ or } [-2 < x, x < 1]$$

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

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