

ply_tex2maxima example 25 No.1

$$(1) \quad \int_0^1 \int_y^{2y} (x^2 + y^2 + 1) dx dy = \frac{4}{3}$$

$$(2) \quad \int_{-1}^1 \int_0^{\sqrt{1-x^2}} x^2 y dy dx = \frac{2}{15}$$

$$(3) \quad \left(\frac{d}{dx} \right)^4 x^5 = 120x$$

$$(4) \quad \frac{d^2}{dx^2} x^5 = 20x^3$$

$$(5) \quad \frac{d^3}{d\theta^3} (\theta \cos \theta) = \theta \sin \theta - 3 \cos \theta$$

$$(6) \quad \frac{d}{dx} f(x) + 2f(x) = 3e^{4x} \quad \text{solution (ode2): } f(x) = \frac{e^{-2x} (e^{6x} + 2\%c)}{2}$$

$$\text{solution (desolve): } f(x) = \frac{e^{-2x} (e^{6x} + 2f(0) - 1)}{2}$$

$$(7) \quad \frac{d^2}{dx^2} f(x) - 2 \frac{d}{dx} f(x) + f(x) = \sin x \quad \text{solution (ode2): } f(x) = \frac{\cos x + (2\%k_2 x + 2\%k_1) e^x}{2}$$

$$\text{solution (desolve): } f(x) = \frac{2xe^x \left(\frac{d}{dx} f(x) \Big|_{x=0} \right) + \cos x + ((1 - 2f(0))x + 2f(0) - 1)e^x}{2}$$

$$(8) \quad \Gamma(5) = 24$$

$$(9) \quad \Gamma\left(-\frac{3}{2}\right) = \frac{4\sqrt{\pi}}{3}$$

$$(10) \quad \frac{\Gamma(11)}{\Gamma(10)} = 10$$

$$(11) \quad \zeta(2) = \frac{\pi^2}{6}$$

$$(12) \quad \zeta(10) = \frac{\pi^{10}}{93555}$$