

Fysiikan matematiikka: Harjoitus 11

1. a) $y = Ae^{\sqrt{2}x} + Be^{-\sqrt{2}x} - \frac{1}{2}x^2 - \frac{1}{2} + e^x$
b) $y = Ae^{2x} + Bxe^{2x} + \frac{1}{2}x^2e^{2x}$

2. $\mathbf{T}(t) = \frac{1}{\sqrt{1+\sin^2(t)}}(\cos(2t)\hat{\mathbf{i}} + \sin(2t)\hat{\mathbf{j}} - \sin(t)\hat{\mathbf{k}})$

3. $S = \operatorname{arsinh}(\sqrt{2}\pi) + \pi\sqrt{2 + 4\pi^2} = 22,4299$

4. $\mathbf{T}(t) = -\sin(t)\hat{\mathbf{i}} - \frac{\cos(t)}{\sqrt{2}}\hat{\mathbf{j}} + \frac{\cos(t)}{\sqrt{2}}\hat{\mathbf{k}}$
 $\mathbf{N}(t) = -\cos(t)\hat{\mathbf{i}} + \frac{\sin(t)}{\sqrt{2}}\hat{\mathbf{j}} - \frac{\sin(t)}{\sqrt{2}}\hat{\mathbf{k}}$
 $\rho = \sqrt{2}$