BY GIMUSI 03/06/2016

$$u'' - 2u' + 2u = e^{\delta} \sin\delta$$

$$X^2 - 2X + 2 = 0 \qquad X = \frac{2 \pm \sqrt{4-8}}{2} = 1 \pm i$$

$$z'' - 2z' + 2z = e^{\delta + i\delta} \qquad u = Im(z)$$

SOLUZIONE DI TENTATIVO: $z = \alpha\delta e^{(1+i)\delta}$

$$\begin{cases} z' = \alpha e^{(1+i)\delta} + \alpha\delta(1+i)e^{(1+i)\delta} \\ z'' = \alpha(1+i)e^{(1+i)\delta} + \alpha(1+i)e^{(1+i)\delta} + \alpha\delta(1+i)^2 e^{(1+i)\delta} = \end{cases}$$

$$= 2\alpha(1+i)e^{(1+i)\delta} + \alpha\delta(1+i)^2 e^{(1+i)\delta}$$

$$\rightsquigarrow 2\alpha(1+i)\cancel{e^{(1+i)\delta}} + \alpha\delta(1+i)^2\cancel{e^{(1+i)\delta}} - 2\alpha\cancel{e^{(1+i)\delta}} +$$

$$-2\alpha\delta(1+i)\cancel{e^{(1+i)\delta}} + 2\alpha\delta\cancel{e^{(1+i)\delta}} = -i\cancel{e^{(1+i)\delta}}$$

$$\cancel{2\alpha} + 2\alpha i + \cancel{\alpha\delta(1-1}+2i) - \cancel{2\alpha} - \cancel{2\alpha\delta} - \cancel{2\alpha\delta i} + \cancel{2\alpha\delta} - 1 = 0$$

$$2\alpha i - 1 = 0 \qquad \alpha = \frac{1}{2i} = -\frac{1}{2}i$$

$$\rightsquigarrow z = -\frac{1}{2}i\delta e^{(1+i)\delta} = -\frac{1}{2}i\delta e^{\delta}(\cos\delta + i\sin\delta) =$$

$$= -\frac{1}{2}\delta e^{\delta}(i\cos\delta - \sin\delta)$$

$$u = Im(z) = -\frac{1}{2}\delta e^{\delta}\cos\delta$$