equazioni differenziali

1. **1**

   Sia $u(x)$ tale che
   $$\begin{cases} u' - 2xu + 2x = 0 \\ u(0) = 0. \end{cases}$$
   Quanto vale $u(1)$?

   - $1 - e$ ✓
   - $e - 1$
   - e
   - $1 + e$

2. **2**

   Sia $u(x)$ tale che
   $$\begin{cases} u' = xe^u \\ u(0) = \ln 2. \end{cases}$$
   Quanto vale $u\left(\frac{1}{2}\right)$?

   - $\ln \frac{3}{2}$
   - $\ln \frac{8}{3}$ ✓
   - $\ln \frac{5}{3}$
   - $\ln \frac{3}{5}$

3. **3**

   Sia $u(x)$ tale che
   $$\begin{cases} u'''' - 2u'' + u = e^x \\ u(0) = 0, \quad u'(0) = \frac{7}{8}, \quad u''(0) = -2, \quad u'''(0) = \frac{27}{8} \end{cases}$$
   Quanto vale $u(1)$?

   - $\frac{1}{e}$ ✓
   - e
   - $e^2 - e$
   - $1 - e$

4. **4**

Sia $u(x)$ tale che

$$\begin{cases} u'' + u = \sin(x+1), \\ u(0) = 0, \quad u'(0) = 0. \end{cases}$$

Quanto vale $u(\pi)$?

- $\frac{\pi}{2}\cos 1$ ✓
- $\frac{\pi}{2\cos 1}$
- $\pi\cos 1 - \sin 1$
- $\frac{\cos 1}{2\pi}$