14. provide a list of functions, which of them solve a given second order DE?

Given the second order ordinary differential equation

$$r^2R'' - rR' + R = 0$$

for $r > 0$, which of the following functions are solutions? (This differential equation is called a Cauchy-Euler equation.)

[Multiple select]

1. $3r\ln(r)$ CORRECT
2. $\sin(2r)$
3. $2r$ CORRECT
4. $4r^2$

15. linear IVP

Solve the initial value problem given by

$$y' + \cos(x)y = e^{x-\sin(x)}, \quad y(\pi) = e^{\pi} + 2.$$

[Multiple choice]

1. $e^{\pi+\sin(x)}$
2. $e^{x-\sin(x)} + 2e^{-\sin(x)}$ CORRECT
3. $2e^{x-\sin(x)}$
4. $2e^{-\pi x+\sin(x)} + 2e^{\sin(x)}$