

# Quiz 1 MTH229H Fall 2023

① Solve  $x^2 + 3x + 1 = 0$ .

Solution: Doesn't seem to factor. So, use quadratic formula:

$$x = \frac{-3 \pm \sqrt{3^2 - 4(1)(1)}}{2(1)} = \frac{-3 \pm \frac{1}{2}\sqrt{9-4}}{2} = -\frac{3}{2} \pm \frac{1}{2}\sqrt{5}$$

② Solve  $2^{x+1} = 3^{3x-2}$

Solution: Take  $\ln$  of both sides to get

$$\begin{aligned} \ln(2^{x+1}) &= \ln(3^{3x-2}) \\ (x+1)\ln(2) &= (3x-2)\ln(3) \\ \ln(2)x + \ln(2) &= 3\ln(3)x - 2\ln(3) \\ [\ln(2) - 3\ln(3)]x &= -2\ln(3) - \ln(2) \\ x &= \frac{-2\ln(3) - \ln(2)}{\ln(2) - 3\ln(3)} \end{aligned}$$