$$3^{2x} - 3^{x+1} + \frac{8}{9} = 0$$

$$(3^x)^2 - 3^x \cdot 3 + \frac{8}{9} = 0$$

c.v. $3^x = a$

$$a^2 - 3a + \frac{8}{9} = 0$$

$$9a^2 - 27a + 8 = 0$$

$$a = \frac{-(-27) \pm \sqrt{(-27)^2 - 4 \cdot 9 \cdot 8}}{2 \cdot 9} = \begin{cases} \frac{1}{3} \\ \frac{8}{3} \end{cases}$$

$$3^x = a = \frac{1}{3} = 3^{-1} \Rightarrow \boxed{x = -1}$$

$$3^x = a = \frac{8}{3} \Rightarrow \log 3^x = \log \frac{8}{3}$$

$$x \log 3 = \log \frac{8}{3}$$

$$\boxed{x = \frac{\log \frac{8}{3}}{\log 3}}$$