Name: _____ Mark: _____

Mini-math Div 3/4: Friday, April 1, 2022 (12 minutes)

1. (2 points) Solve the following differential equation:

$$\frac{dy}{dx} = xy \sin(x^2) \cdot \ln y$$

2. (2 points) During a chemical reaction, the rate of change of the amount of the chemical remaining is proportional to the amount remaining. At time $t = 0$, the amount of the chemical is 60 g. At time $t = 8$, the amount of the chemical is 12 g. At what time t is the amount of the chemical 4 g?

A. $\frac{4\sqrt{42}}{3}$ B. $\frac{28}{3}$ C. $\frac{8 \ln 15}{\ln 5}$ D. $\frac{8 \ln 4}{\ln 12}$

3. (2 points) (AP) Solve the following initial value problem:

$$\frac{dy}{dx} = y^2, \quad y(3) = -2$$

A. $y = \dfrac{1}{5/2 - x}$ for $x \neq 5/2$

B. $y = \dfrac{2}{5 - 2x}$ for $x > 5/2$

C. $y = -\dfrac{1}{x} - \dfrac{5}{3}$ for $x \neq 0$

D. $y = -\dfrac{5x + 3}{3x}$ for $x > 0$