Name: _____ Mark: _____

Mini-math Div 3/4: Monday, April 12, 2021 (15 minutes)

1. A particle moves along the x-axis so that the acceleration at any time t is given by $a(t) = 2t$. At time $t = 0$, the velocity of the particle is $v(0) = -4$ and at time $t = 1$, the position is $s(1) = 20$.

   (a) (2 points) What is the velocity as a function of t?

   (b) (2 points) How far does the particle move from $t = 0$ to $t = 2$?

2. (2 points) Suppose that the graph of $y = f(x)$ satisfies $\dfrac{dy}{dx} = xy$ for all x and that $f(1) = 5$. Find an equation of the line tangent to the graph of y at $(1, 5)$.

3. (4 points) Find the general solution to the differential equation

$$\frac{dy}{dx} = x + xy$$