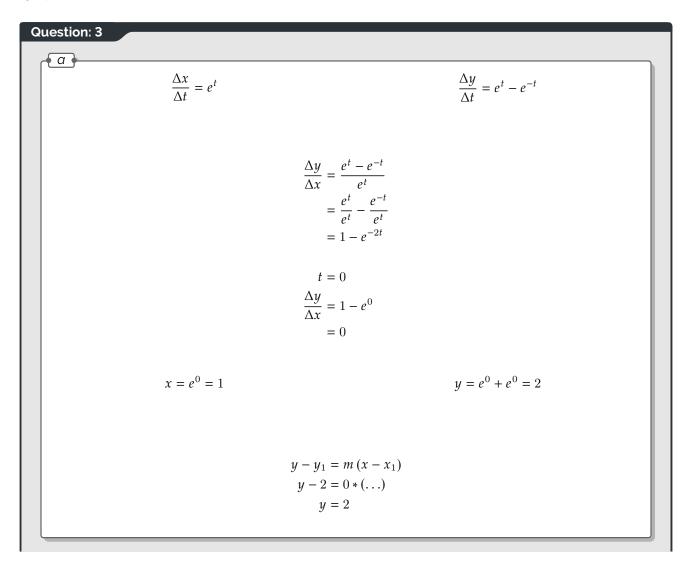
9G and 9H Jack Maguire

9G



b

$$\frac{\Delta x}{\Delta t} = 2\sin 2t$$

$$\frac{\Delta y}{\Delta t} = 2\cos 2t$$

$$\frac{\Delta y}{\Delta x} = \frac{2\cos 2t}{2\sin 2t}$$
$$= \cot 2t$$

$$t = \frac{\pi}{6}$$
$$\frac{\Delta y}{\Delta x} = \cot \frac{\pi}{3}$$
$$= \frac{\sqrt{3}}{3}$$

$$x = 1 - \cos\frac{\pi}{3} = \frac{1}{2}$$

$$y = \sin\frac{\pi}{3} = \frac{\sqrt{3}}{2}$$

$$y - y_1 = m(x - x_1)$$

$$y - \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{3} \left(x - \frac{1}{2} \right)$$

$$y - \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{3} x - \frac{\sqrt{3}}{6}$$

$$y = \frac{\sqrt{3}}{3} x + \frac{\sqrt{3}}{3}$$

Question: 4

$$x = \frac{t}{1-t}$$

$$\frac{\Delta x}{\Delta t} = \frac{vu' - v'u}{v^2}$$

$$= \frac{1-t+t}{1-2t+t^2}$$

$$= \frac{1}{t^2 - 2t + 1}$$

$$y = \frac{t^2}{1 - t}$$

$$\frac{\Delta y}{\Delta t} = \frac{vu' - v'u}{v^2}$$

$$= \frac{2t(1 - t) + t^2}{1 - 2t + t^2}$$

$$= \frac{2t - t^2}{t^2 - 2t + 1}$$

$$\frac{\Delta y}{\Delta x} = \frac{2t - t^2}{1 - 2t + t^2} \div \frac{1}{t^2 - 2t + 1}$$

$$= \frac{(2t - t^2)(t^2 - 2t + 1)}{t^2 - 2t + 1}$$

$$= 2t - t^2$$

$$0 = 2t - t^2$$

$$t = 0, 2$$

$$t = 0$$

$$x = \frac{t}{1 - t}$$

$$= 0$$

$$y = \frac{t^2}{1 - t}$$

$$= 0$$

$$t = 2$$

$$x = \frac{t}{1 - t}$$

$$= -2$$

$$y = \frac{t^2}{1 - t}$$

$$= -4$$

$$=(0,0),(-2,-4)$$

9H

Question: 4

$$0 = 2x + 6xy\frac{\Delta y}{\Delta x} + 3y^2 - 3y^2\frac{\Delta y}{\Delta x}$$
$$-2x - 3y^2 = 6xy\frac{\Delta y}{\Delta x} - 3y^2\frac{\Delta y}{\Delta x}$$
$$\frac{\Delta y}{\Delta x} = \frac{-2x - 3y^2}{6xy - 3y^2}$$
$$= -\frac{3y^2 + 2x}{3y^2 - 6xy}$$
$$= -\frac{3 * 1^2 + 2 * 2}{3 * 1^2 - 6 * 2 * 1}$$
$$= -\frac{7}{9}$$

Question: 5

$$2x + \frac{\Delta y}{\Delta x} = 3(x+y)^2 \left(1 + \frac{\Delta y}{\Delta x}\right)$$
$$2x + \frac{\Delta y}{\Delta x} = 3(x+y)^2 + 3\frac{\Delta y}{\Delta x}(x+y)^2$$
$$3(x+y)^2 - 2x = \frac{\Delta y}{\Delta x} - 3\frac{\Delta y}{\Delta x}(x+y)^2$$
$$\frac{\Delta y}{\Delta x} = \frac{3(x+y)^2 - 2x}{1 - 3(x+y)^2}$$
$$= \frac{3(1+0)^2 - 2 * 1}{1 - 3(1+0)^2}$$
$$= -\frac{1}{2}$$