Problem 2.7*: The initial wave function for a particle in an infinite square well of width a is given below.

$$\Psi(x,0) = \begin{cases} Ax & 0 \le x \le \frac{1}{4}a \\ \frac{1}{3}A(a-x) & \frac{1}{4}a \le x \le a \end{cases}$$

(a) Determine the normalization constant A.

(b) Sketch $\Psi(x,0)$.

(c) Sketch the probability density.

(d) Find $\Psi(x,t)$.

(e) For the initial wave function above use a mathematical tool to animate $|\Psi(x,t)|^2$.