

Problem Set 9

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Problem 1

An animation is created according to the instructions. The equation

$$Ax = v \tag{1}$$

is solved by simply left-multiplying both sides by A^{-1} .

I observe that the wavefunction is at first concentrated in the middle of the well. As time goes on, the wave moves to the right and “bumps off” the right wall of the well. During the motion of the wave, the waveform gradually spreads out in the well.

In physics terms, the wavefunction is gradually dispersed over time. At first, it is most likely to find the particle around the center of the well, but as time goes on, the particle moves around, so it is more and more likely to be found elsewhere. If we divide the well into appropriately-sized bars, then eventually, the probability of finding the particle within some bar is almost the same for all bars (which cover the entire well).

My Github link: <https://github.com/ziqui-wang/phys-ua210>. The animation is contained in the corresponding repository.