

Problem 2.33

You'll want to use the Mathematica files you've been building.

(a) Sketch this potential.

For each of the three cases:

(b) Sketch the wave function on the potential graph.

(c) Write the wave function for each of the three regions $\{x < -a, -a < x < a, x > a\}$.

(d) Use the boundary conditions to get four equations for the five unknown amplitudes.

(e) Use Mathematica to find the transmission and reflection coefficients and show they sum to one.

(f) Graph the transmission coefficient versus k . Explain the curves on physical grounds.

Problem 2.34

You'll want to use the Mathematica files you've been building.

(a) Sketch this potential.

For the two cases:

(b) Sketch the wave function on the potential graph.

(c) Write the wave function for each of the two regions $\{x < 0 \text{ and } x > 0\}$.

(d) Use the boundary conditions to get two equations for the three unknown amplitudes.

(e) Use Mathematica to find reflection coefficients.

(f) Make arguments on physical grounds that your result is plausible.