Chapter 9: Wave Interactions

Mini Investigation: Media Changes, page 415

A. In each situation, the transmitted wave keeps the orientation of the original wave while the reflected wave has the opposite orientation.
B. The sum of the two new amplitudes (of the reflected wave and the transmitted wave) equals the amplitude of the original wave.

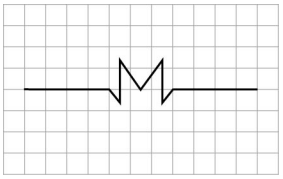
Section 9.1: Interference of Waves

Mini Investigation: Demonstrating Interference with Springs, page 417

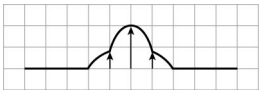
A. When a single pulse was sent down the Slinky, the tab reached an amplitude that equalled the amplitude of the pulse.
B. When two positive pulses were sent down the Slinky from opposite ends, the tab reached an amplitude that equalled the sum of the amplitudes of the pulse.
C. When a positive pulse and a negative pulse were sent down the Slinky, the tab did not move.

Tutorial 1 Practice, page 419

1.

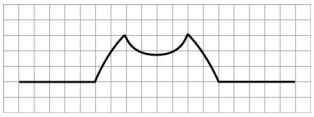


2.

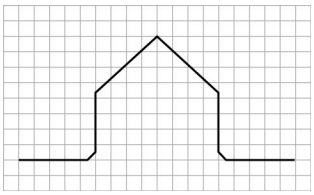


Section 9.1 Questions, page 419

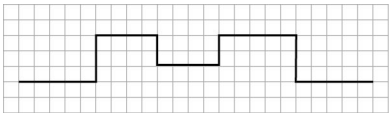
1. (a) When waves in phase combine, then the resulting amplitude is the sum of the two original amplitudes.
(b) When waves out of phase combine, they form a wave with an amplitude less than at least one of the initial waves.
2. (a)



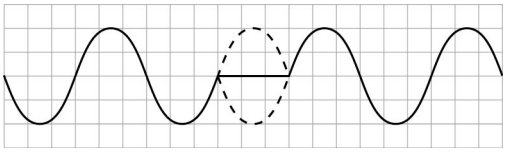
(b)



(c)



3. (a) Answers may vary. Sample answer:
The two waves are out of phase by half a wavelength, so they would cancel one another.
(b) Since every point on the wave coming from the left has the same amplitude but in the opposite direction of its equivalent point on the wave coming from the right, the interference will result in no amplitude.



(c) Eventually, the waves will completely cancel each other out, leaving just the equilibrium point.