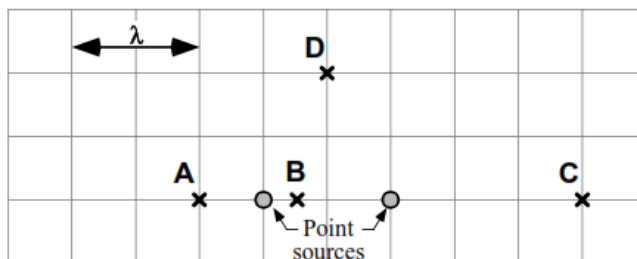


AP Physics 2 – Double Slit & Thin Film

E1-RT06: WAVE SOURCES SEPARATED BY ONE WAVELENGTH—INTENSITY

Two identical point sources are generating waves with the same frequency and amplitude. The two sources are in phase with each other, so the two sources generate wave crests at the same instant. The wavelength of the waves is equal to the distance between the two sources.



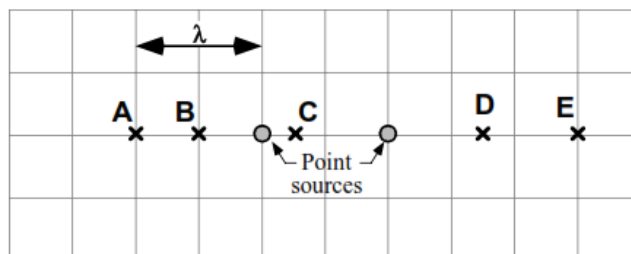
Rank the maximum amplitude of the wave at the labeled points.

1 Greatest	2	3	4 Least	OR	<input type="checkbox"/> All the same	<input type="checkbox"/> All zero	<input type="checkbox"/> Cannot determine
---------------	---	---	------------	----	---	---	---

Explain your reasoning.

E1-QRT07: WAVE SOURCES SEPARATED BY ONE WAVELENGTH I—INTERFERENCE

Two identical point sources are generating waves with the same frequency and amplitude. The two sources are in phase with each other, so the two sources generate wave crests at the same instant. The wavelength of the waves is equal to the distance between the two sources.



List all the labeled points where the waves from the two sources constructively interfere. If there are no such points, indicate that by stating “none of them.” _____

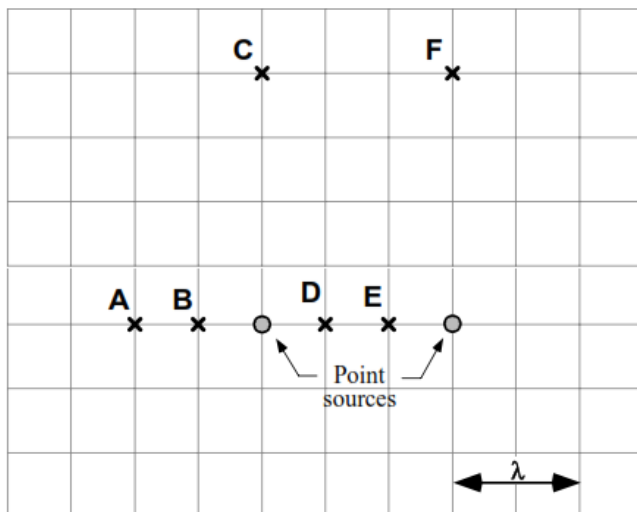
Explain your reasoning.

List all the labeled points where the waves from the two sources destructively interfere. If there are no such points, indicate that by stating “none of them.” _____

Explain your reasoning.

E1-QRT08: WAVE SOURCES SEPARATED BY ONE AND ONE-HALF WAVELENGTHS—INTERFERENCE

Two identical point sources are generating waves with the same frequency and amplitude. The two sources are in phase with each other, so the two sources generate wave crests at the same instant. The distance between the two sources is equal to one and one-half times the wavelength, or 1.5λ .



List all the labeled points where the waves from the two sources constructively interfere. If there are no such points, indicate that by stating “none of them.” _____

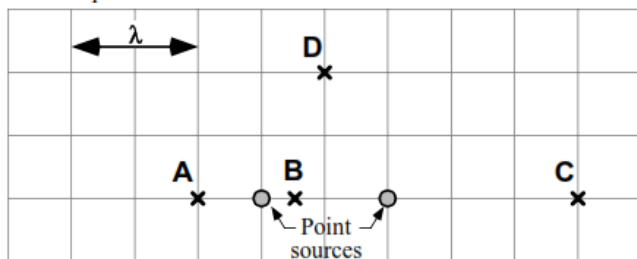
Explain your reasoning.

List all the labeled points where the waves from the two sources destructively interfere. If there are no such points, indicate that by stating “none of them.” _____

Explain your reasoning.

E1-QRT10: WAVE SOURCES SEPARATED BY ONE WAVELENGTH II—INTERFERENCE

Two identical point sources are generating waves with the same frequency and amplitude. The two sources are *out of phase* with each other, so at the instant that one source is creating a crest, the other source is creating a trough. The wavelength of the waves is equal to the distance between the two sources.



List all the labeled points where the waves from the two sources constructively interfere. If there are no such points, indicate that by stating “none of them.” _____

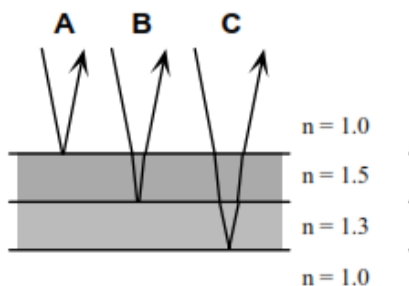
Explain your reasoning.

List all the labeled points where the waves from the two sources destructively interfere. If there are no such points, indicate that by stating “none of them.” _____

Explain your reasoning.

E2-QRT44: THIN FILMS IN AIR—PHASE CHANGES

A beam of light is reflected from a thin film made of two layers of different materials. The figure shows what happens to three of the incident rays. The light is initially traveling in air.



When ray A is reflected from the top layer, will there be a phase change?
 Explain your reasoning.

When ray B is reflected from the top of the second layer, will there be a phase change?
 Explain your reasoning.

When ray C is reflected from the bottom of the second layer, will there be a phase change?
 Explain your reasoning.

E2-CT46: TWO LASERS AND TWO SLITS—BRIGHT FRINGE SEPARATION

In each case, a beam of light from a laser passes through very narrow slits cut in a mask. The light then hits a distant screen, creating an interference pattern. The two cases are identical except that in Case A the light beam is red, and in Case B it is blue.

Will the distance between bright fringes on the screen in Case A be (i) *greater than*, (ii) *less than*, or (iii) *equal to* the distance between bright fringes on the screen in Case B? _____

Explain your reasoning.

