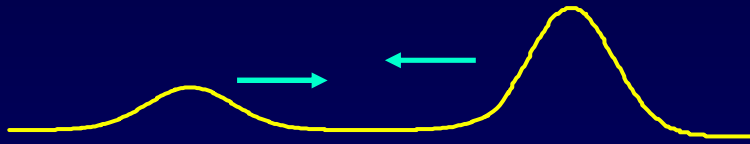# Solution

Pulses 1 and 2 pass through each other.
Pulse 2 has four times the peak intensity of pulse 1, i.e., $I_2 = 4\,I_1$.

NOTE: These are not harmonic waves, so the time average isn't useful.
By "peak intensity", we mean the square of the peak amplitude.

1. What is the maximum possible total combined intensity, I_{max}?

a) $4\,I_1$

b) $5\,I_1$

c) $9\,I_1$

Add the amplitudes, then square the result:

$$A_2 = \sqrt{I_2} = \sqrt{4I_1} = 2\sqrt{I_1} = 2A_1$$

$$I_{tot} = \left(A_{tot}\right)^2 = \left(A_1 + A_2\right)^2 = \left(A_1 + 2A_1\right)^2 = 9A_1^2 = 9I_1$$

2. What is the minimum possible intensity, I_{min}?

a) 0

b) I_1

c) $3\,I_1$

This happens when one of the pulses is upside down.