28 A beam of light with power P has an area of cross-section A.

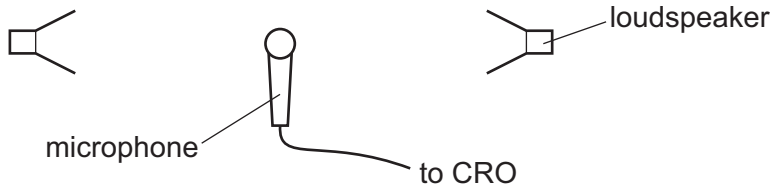
The amplitude of the light waves in the beam is X.

The beam of light is then changed to one with the same frequency but with an increased amplitude of $4X$ and an area of cross-section reduced to $\frac{A}{3}$.

What is the power of the new beam?

A $1.3P$ **B** $5.3P$ **C** $12P$ **D** $48P$

29 Two loudspeakers are connected to the same signal generator. The signal generator produces a single frequency. The loudspeakers face each other so that a stationary sound wave is set up in the region between the loudspeakers.



A microphone is connected to a cathode-ray oscilloscope (CRO) and positioned between the two loudspeakers.

The microphone is moved along a line joining the two loudspeakers.

The signal on the CRO shows 5 maximum amplitudes as the microphone moves. The microphone moves a distance of 2.0 m from the position that gives the first maximum to the position that gives the fifth maximum.

What is the wavelength of the sound wave?

A 0.40 m **B** 0.50 m **C** 0.80 m **D** 1.0 m

30 Two wave sources emit coherent waves.

Which condition **must** be correct for the coherent waves?

A The waves are emitted in phase.

B The waves are emitted and move in opposite directions.

C The waves are emitted with a constant phase difference.

D The waves are emitted with the same amplitude.