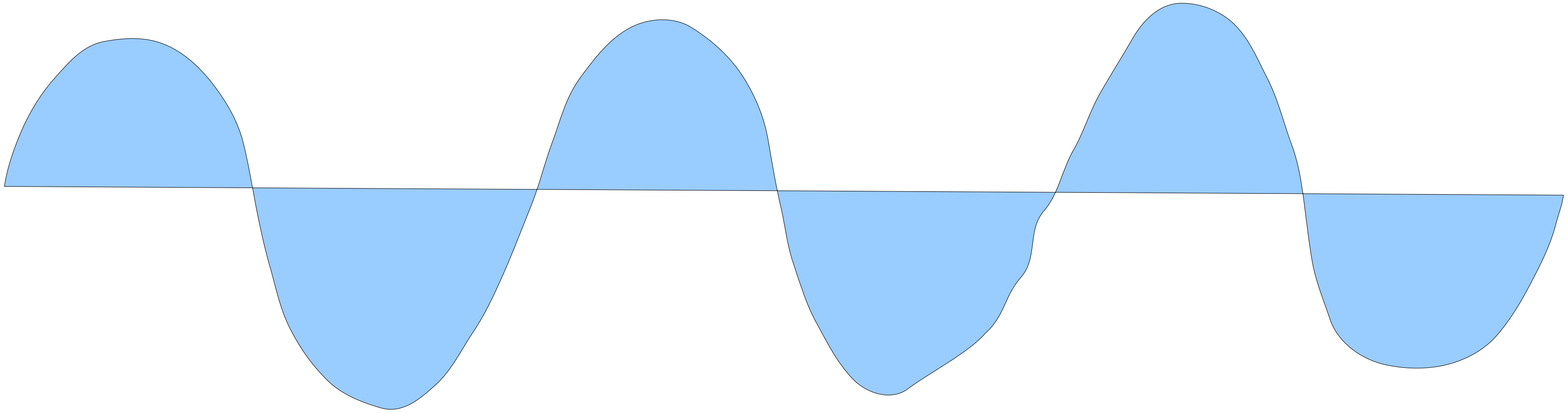


The sinusoidal curve often used to denote electromagnetic radiation represents:

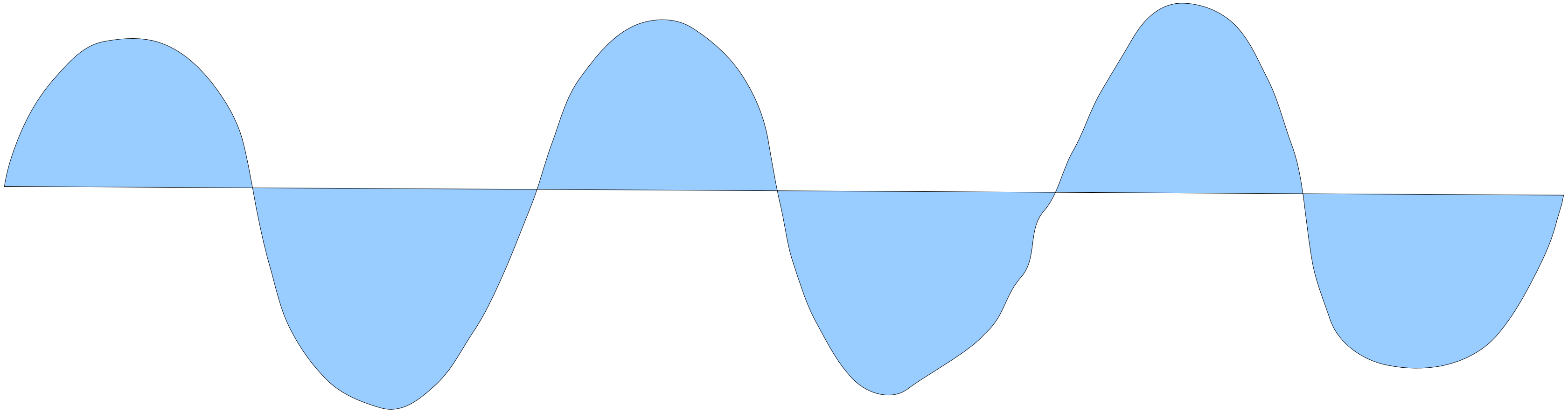
A) Path of the light

B) The region where the electric and magnetic fields are non-zero

C) The strength and direction of the electric field along a line in the direction of the wave

D) Photons oscillating up and down as the beam passes them

E) Intensity of the radiation along a line in the direction of the wave



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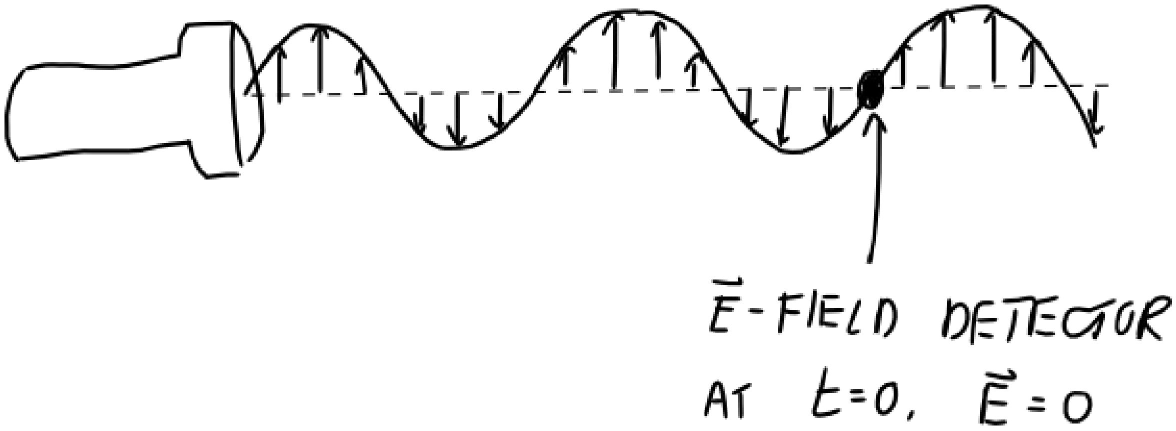


At what time will the detector show E=0 again?

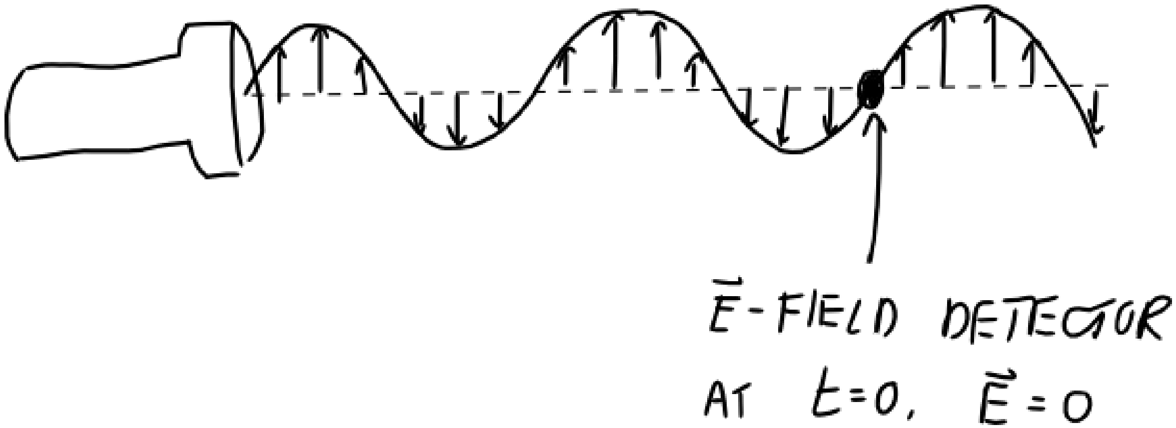
A) λc/2

B) λ/c

C) λ/2c

D) 2c/λ

E) c/2λ



At what time will the detector show E=0 again?

A) $\lambda c/2$

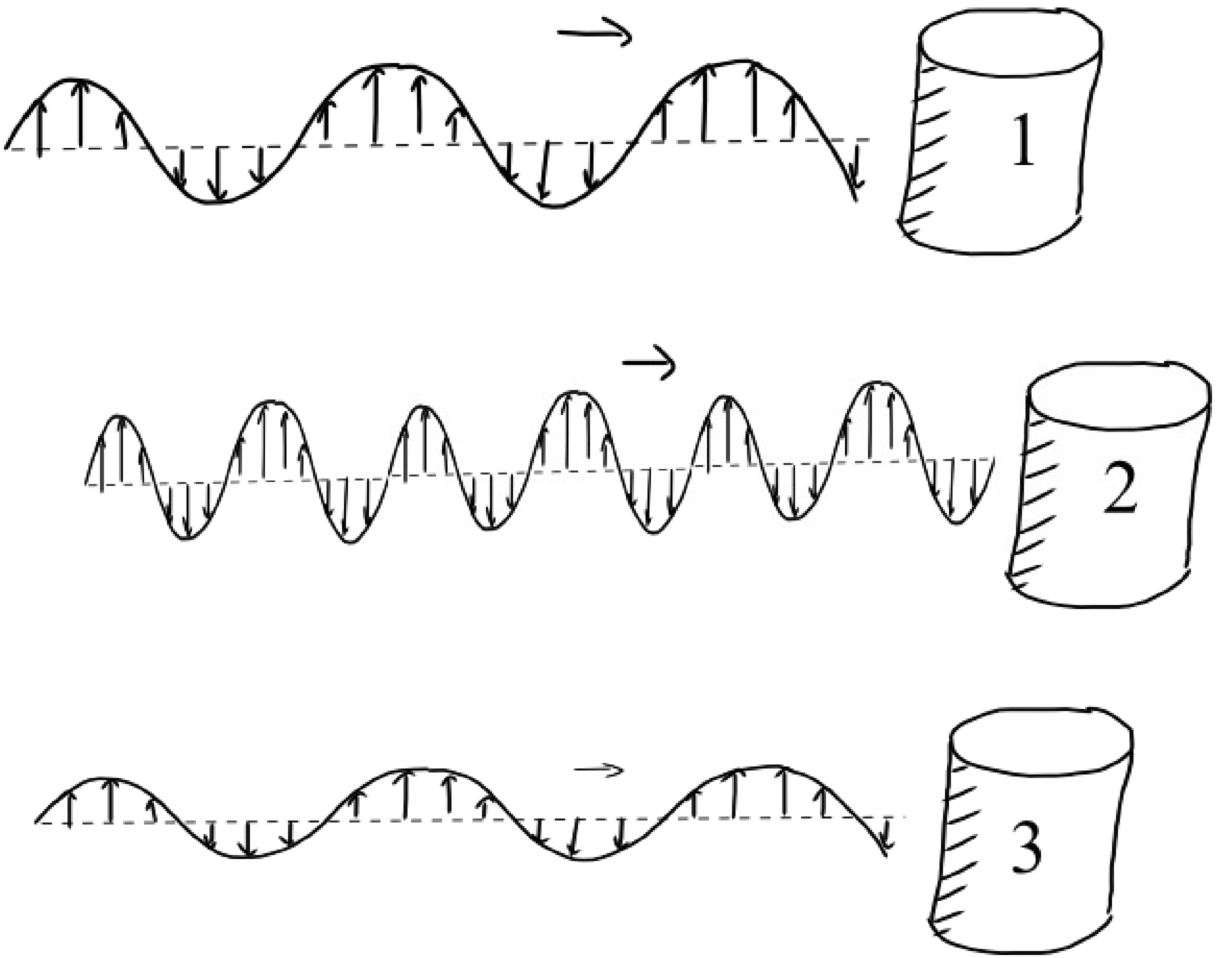
B) λ/c

C) $\lambda/2c$

D) $2c/\lambda$

E) $c/2\lambda$

The light must move by half a wavelength, with speed c, so
time = $(\lambda/2)/c = \lambda/2c$



Light is incident on three barrels. Which will heat fastest?

($\lambda_1 = \lambda_3$, $E_1 = E_2$)

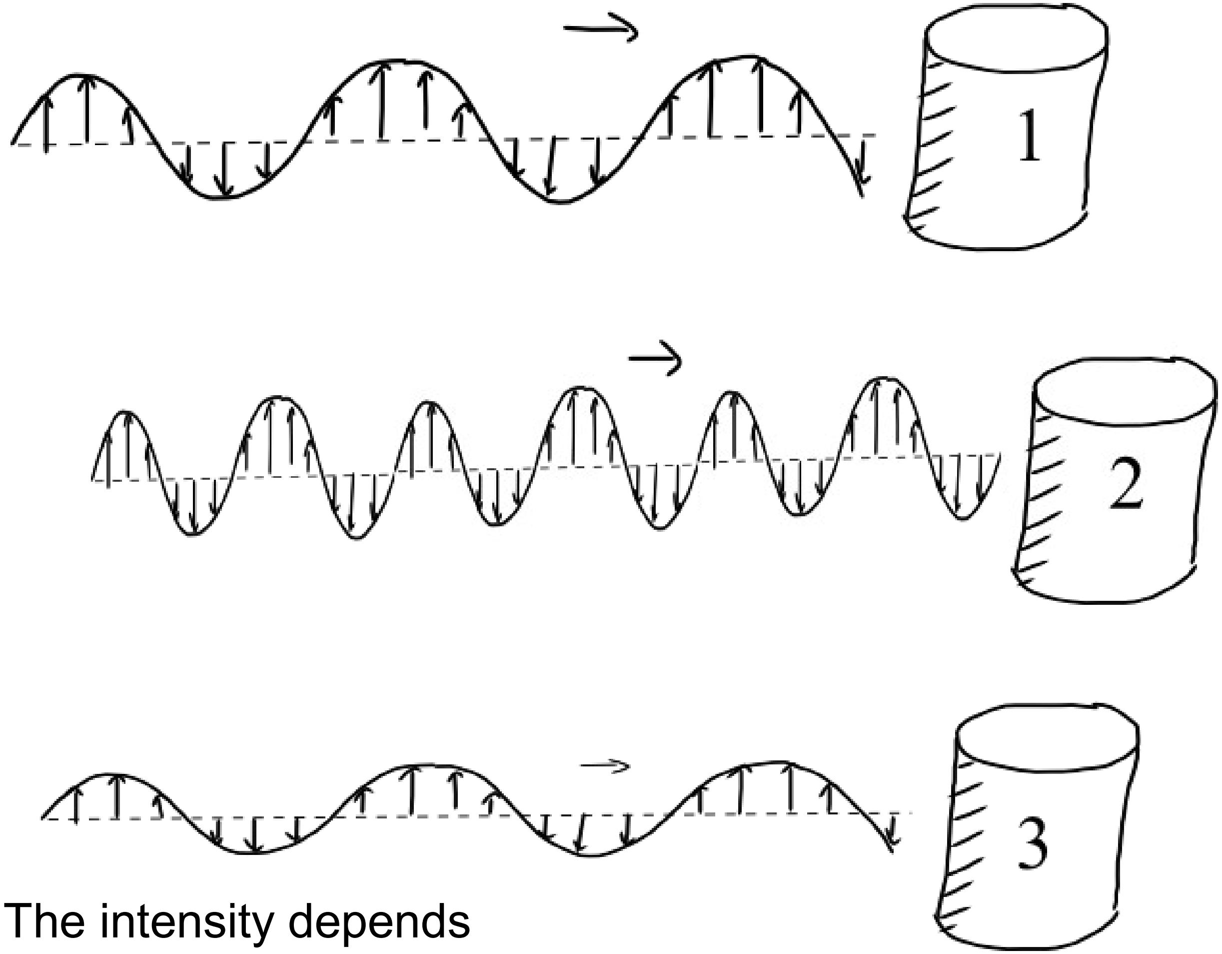
A) 2 > 1 > 3

B) 1 > 2 > 3

C) 1 = 2 > 3

D) 1 = 3 > 2

E) 2 > 1 = 3



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The intensity depends only on the amplitude, and not on frequency. 1 and 2 have same amplitude and therefore same intensity, while 3 has less. Energy is intensity times time and area of exposure (assumed same in all three)

A) $2 > 1 > 3$

B) $1 > 2 > 3$

C) $1 = 2 > 3$

D) $1 = 3 > 2$

E) $2 > 1 = 3$

Which of the following will produce electromagnetic radiation according to classical theory?

A) Electron orbiting the atomic nucleus

B) A circuit with DC current in it

C) A circuit with AC current in it

D) A and C

E) B and C

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Electron has acceleration as it orbits, and electrons in a AC circuit accelerate in response to a varying potential. In a DC circuit things are at steady state with no (net) acceleration, so no radiation is produced.