Is "The Wave" at the stadium a transverse wave or a longitudinal wave?

A. Transverse
B. Longitudinal
C. Neither

A sound wave is a:

A. transverse wave
B. longitudinal wave
C. it's not a wave at all

A wave on a stretched drum head is an example of a:

A. transverse wave
B. longitudinal wave
C. it's not a wave at all

ANNOUNCEMENTS

- Quiz this Friday (Maxwell Ampere + Poynting Vector)
  - Determine the electric and magnetic field in a situation where there is a displacement current
  - Discuss the direction of the Poynting vector and how it relates to conservation of energy

The electric field for a plane wave is given by:

$$\mathbf{E}(\mathbf{r}, t) = \mathbf{E}_0 e^{i(\mathbf{k}\cdot\mathbf{r}-\omega t)}$$

The vector $\mathbf{k}$ tells you:

A. The direction of the electric field vector.
B. The speed of the traveling wave.
C. The direction the plane wave moves.
D. A direction perpendicular to the direction the plane wave moves
E. None of these/MORE than one of these/???

The electric field for a plane wave is given by:

$$\mathbf{E}(\mathbf{r}, t) = \mathbf{E}_0 e^{i(\mathbf{k}\cdot\mathbf{r}-\omega t)}$$

Suppose $\mathbf{E}_0$ points in the $+x$ direction. Which direction is this wave moving?

A. The x direction.

B. The radial (r) direction

C. A direction perpendicular to both $\mathbf{k}$ and $\mathbf{x}$

D. The $\mathbf{k}$ direction

E. None of these/MORE than one of these

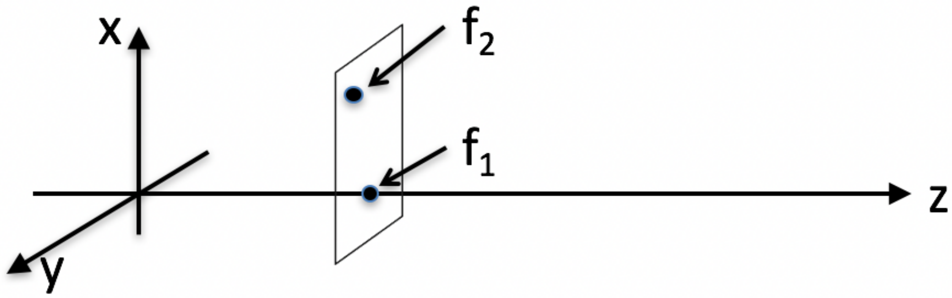
A wave is moving in the $+z$ direction:

$$f(x, y, z, t) = Re\left[Ae^{i(kz - \omega t + \delta)}\right]$$

The value of f at the point $(0, 0, z_0, t)$ and the point at (x, y, z_0, t) are related how?

$$f_1 = f(0, 0, z_0, t) \text{ vs. } f_2 = f(x, y, z_0, t)$$

A. $f_1 = f_2$ always
B. $f_1 >$ or $<$ or $= f_2$ depending on the value of x, y



The electric field of an E/M wave is described by:

$$\mathbf{E} = E_0 \sin(kx - \omega t)\hat{\mathbf{y}}$$

What is the direction of the magnetic field?

A. $+x$

B. $+y$

C. $-x$

D. $+z$

E. $-z$

You have this solution to Maxwell's equations in vacuum:

$$\widetilde{\mathbf{E}}(x, y, z, t) = \widetilde{\mathbf{E}}_0 \exp[i(\mathbf{k} \cdot \mathbf{r} - \omega t)]$$

If this wave travels in the y direction, is polarized in the x direction, and has a complex phase of 0, what is the x component of the physical wave?

A. $E_x = E_0\, cos\,(kx - \omega t)$
B. $E_x = E_0\, cos\,(ky - \omega t)$
C. $E_x = E_0\, cos\,(kz - \omega t)$
D. $E_x = E_0\, cos\left(k_x x + k_y y - \omega t\right)$
E. Something else

The electric fields of two EM waves in vacuum are both described by:

$$\mathbf{E} = E_0 \sin(kx - \omega t)\hat{y}$$

The "wave number" k of wave 1 is larger than that of wave 2, $k_1 > k_2$. Which wave has the larger frequency f?

A. Wave 1
B. Wave 2
C. impossible to tell