$y(x,t)=\dfrac{0.8}{(4x+5t)^2+5}$ represents a moving pulse, where x, y are in metre and t in second. Then:

(A) pulse is moving in +x direction
(B) in 2 second it will travel a distance of 2.5 metre
(C) its maximum displacement is 0.16 metre
(D) it is a symmetric pulse about x-axis

Solution

Comparing $kx+\omega t$ with 4x + 5t, $k=4$ & $\omega=5, v=\dfrac{\omega}{k}=\dfrac{5}{4}=1.25 m/s$

If t = 2 s, d = vt = 1.25 x 2 = 2.5 m

$y_{\max}=\dfrac{0.8}{0^2+5}=0.16\,\text{m}$

The pulse exists above x-axis only and hence is not symmetric about x-axis.

Also if $y(x,t)=f(kx+\omega t)$ the direction of motion is towards -ve x axis.

Hence, (B) & (C)