A string is jiggled by two independent oscillators, creating two waves:

$$y_1(x,t) = 2.6\text{ mm}\cos\left(19\tfrac{\text{rad}}{\text{m}}x - 6\tfrac{\text{rad}}{\text{s}}t + 0.58\text{ rad}\right)$$

$$y_2(x,t) = 2.6\text{ mm}\cos\left(19\tfrac{\text{rad}}{\text{m}}x - 6\tfrac{\text{rad}}{\text{s}}t + 1.78\text{ rad}\right)$$

The two waves interfere to create a summed wave $y_3(x,t)$. What are its properties?

The difference in phase between y_1 and y_2 is

$$\Delta\phi = (1.78\text{ rad} - 0.58\text{ rad}) = 1.20\text{ rad}$$

So the sum can be written, in general, as

$$y_3(x,t) = 2A\cos\left(\frac{\phi}{2}\right)\cos\left(kx - \omega t + \frac{\phi}{2}\right)$$

and in this case

$$y_3(x,t) = 5.2\text{ mm}\,(0.83)\cos\left(19\tfrac{\text{rad}}{\text{m}}x - 6\tfrac{\text{rad}}{\text{s}}t + 0.6\text{ r}\right.$$

$$\rightarrow \text{amp} = 5.2\text{ mm}\,(0.83) = 4.3\text{ mm}$$

$$\omega = 6\tfrac{\text{rad}}{\text{s}}$$

$$V_s = \frac{\omega}{K} = \frac{6\frac{\text{rad}}{\text{s}}}{19\frac{\text{rad}}{\text{m}}} = 0.32\tfrac{\text{m}}{\text{s}}$$

The maximum transverse speed can be found by taking derivative

$$v_y(x,t) = \frac{dy_3}{dt} = -6\,\frac{\text{rad}}{\text{s}}\,(4.3\text{ mm})\cos\left(19\,\frac{\text{rad}}{\text{m}}\,x - 6\,\frac{\text{rad}}{\text{s}}\,t + 0.6\text{ rad}\right)$$

The maximum value of this speed is

$$\max v_y = -6\,\frac{\text{rad}}{\text{s}}\,(4.3\text{ mm}) = 26\,\frac{\text{mm}}{\text{s}}$$