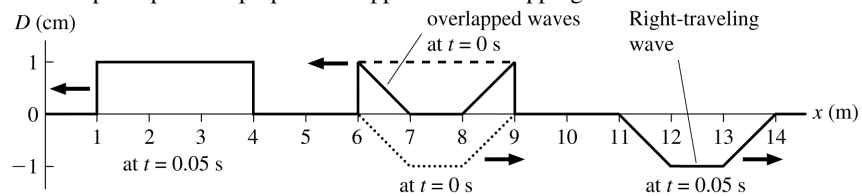


21.33. Model: The principle of superposition applies to overlapping waves.

Visualize:



Solve: Because the wave pulses travel along the string at a speed of 100 m/s, they move a distance of $d = vt = (100 \text{ m/s})(0.05 \text{ s}) = 5 \text{ m}$ in 0.05 s. The front of the wave pulse moving left, which is located at $x = 1 \text{ m}$ at $t = 0.05 \text{ s}$, was thus located at $x = 6 \text{ m}$ at $t = 0 \text{ s}$. This helps us draw the snapshot of the wave pulse moving left at $t = 0 \text{ s}$ (shown as a dashed line). Subtracting this wave snapshot from the resultant at $t = 0 \text{ s}$ (shown as a solid line) yields the right-traveling wave's snapshot at $t = 0 \text{ s}$ (shown as a dotted line). Finally, the snapshot graph of the wave pulse moving right at $t = 0.05 \text{ s}$ is the same as at $t = 0 \text{ s}$ (shown as a dotted line) except that it is shifted to the right by 5 m.