

20.1. Model: This is a wave traveling at constant speed. The pulse moves 1 m to the right every second.

Visualize: Please refer to Figure Ex20.1. The snapshot graph shows the wave at all points on the x -axis at $t = 0$ s. You can see that nothing is happening at $x = 6$ m at this instant of time because the wave has not yet reached this point. The leading edge of the wave is still 1 m away from $x = 6$ m. Because the wave is traveling at 1 m/s, it will take 1 s for the leading edge to reach $x = 6$ m. Thus, the history graph for $x = 6$ m will be zero until $t = 1$ s. The first part of the wave causes an upward displacement of the medium. The rising portion of the wave is 2 m wide, so it will take 2 s to pass the $x = 6$ m point. The constant part of the wave, whose width is 2 m, will take 2 seconds to pass $x = 6$ m and during this time the displacement of the medium will be a constant ($\Delta y = 1$ cm). The trailing edge of the pulse arrives at $t = 5$ s at $x = 6$ m. The displacement now becomes zero and stays zero for all later times.

