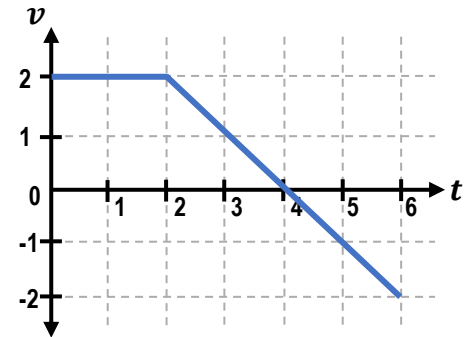## CONCEPT: CALCULATING DISPLACEMENT FROM VELOCITY-TIME GRAPHS
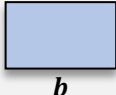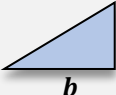
● In velocity-time graphs, the **<u>displacement</u>** (Δx) between two points is the _____ "under the curve" (graph)

   - "under the curve" = between the **graph** and **time** axis

EXAMPLE: The velocity-time graph for a moving object is shown.

   **a)** Calculate the displacement for the first 4.0s

   b) Calculate the displacement for the entire motion

● Areas _above_ the **time** axis → **[POSITIVE | NEGATIVE]** displacement Δx

● Areas _below_ the **time** axis → **[POSITIVE | NEGATIVE]** displacement Δx

Rectangle	Triangle
h, b	h, b
$A = b * h$	$A = \dfrac{1}{2}b * h$

PRACTICE: A moving box's motion is described by the velocity graph below. The box's initial position is $x_0 = 0$. **(a)** How far has the box moved from $t=0$ to $t=4.0s$? **(b)** How far does the box move from $t=4$ to $t=10s$?
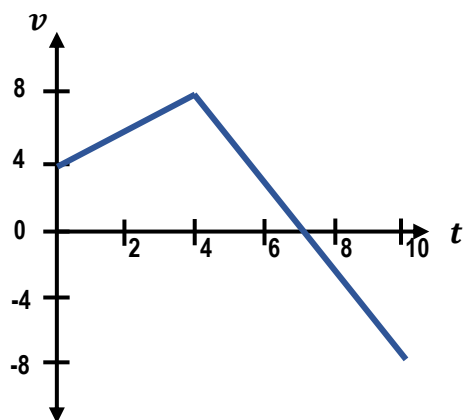
EXAMPLE: The figure shows the velocity graph for a car having initial position x_0 = -21m at t = 0. What is the car's final position at t=5.0s?

v

10

8

6

4

2

1 2 3 4 5 t