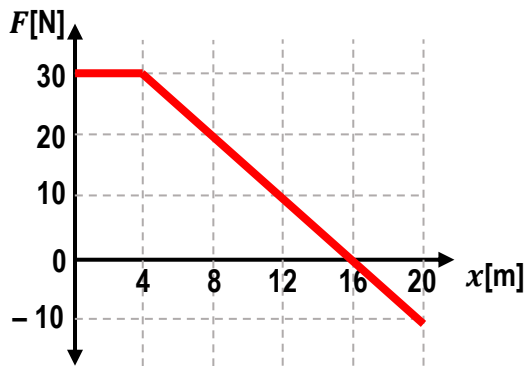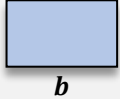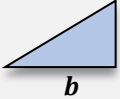## CONCEPT: CALCULATING WORK FROM FORCE VS. DISPLACEMENT GRAPHS

● The WORK done by ANY force (constant or variable) is the _____ under the F vs. x graph.

   - "under the graph" = between the **graph** and the **x axis.**

   - Areas _above_ the **x** axis → **[POSITIVE | NEGATIVE]** Work

   - Areas _below_ the **x** axis → **[POSITIVE | NEGATIVE]** Work

EXAMPLE**:** You push a box along a flat, smooth surface for 20m according to the graph shown below**.** How much work have you done on the box?

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

PROBLEM: A force is applied to a 4kg remote-controlled car as it moves along the track. The force varies with distance according to the graph shown below. The car is initially at rest. Calculate the speed of the car at x = 4m.

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