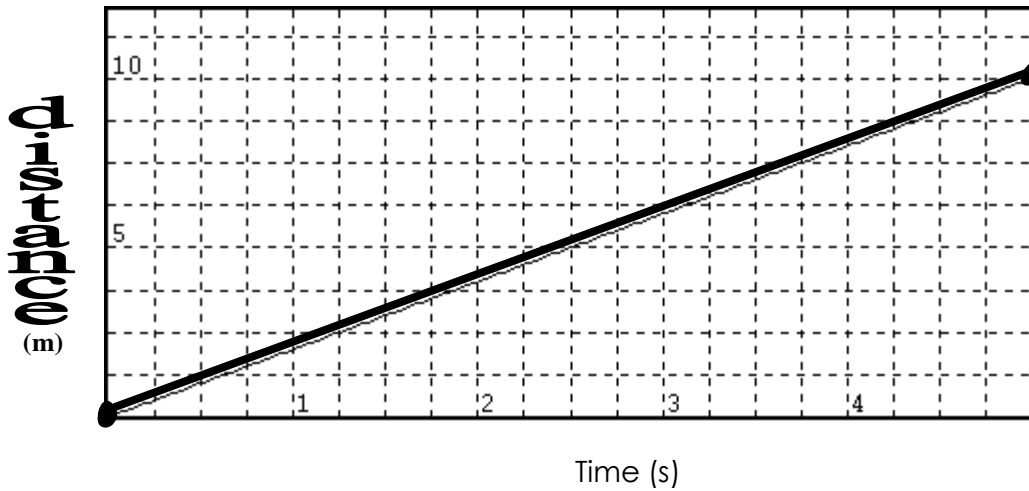


Graphical Analysis Review

1) On any question with a graph when not sure how to proceed you should:

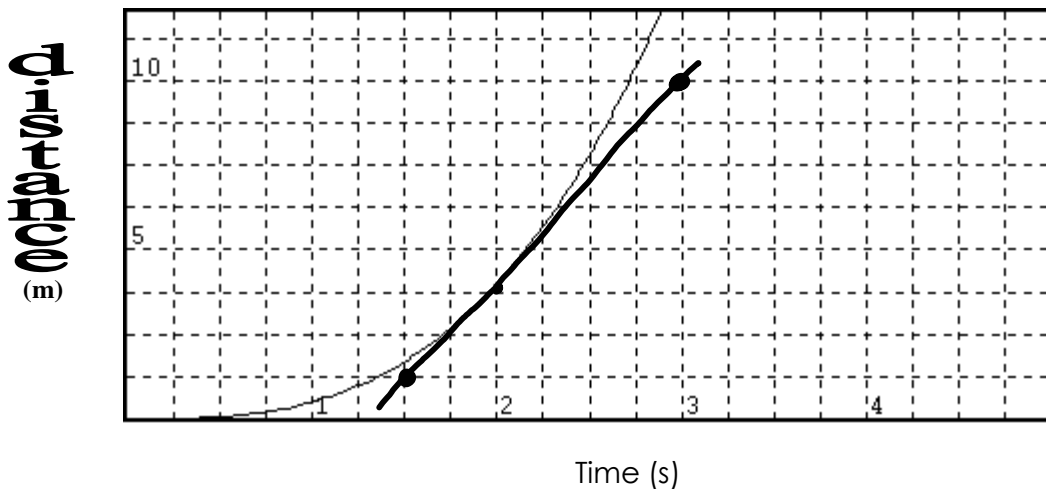
find the slope

2) Find the velocity on the graph



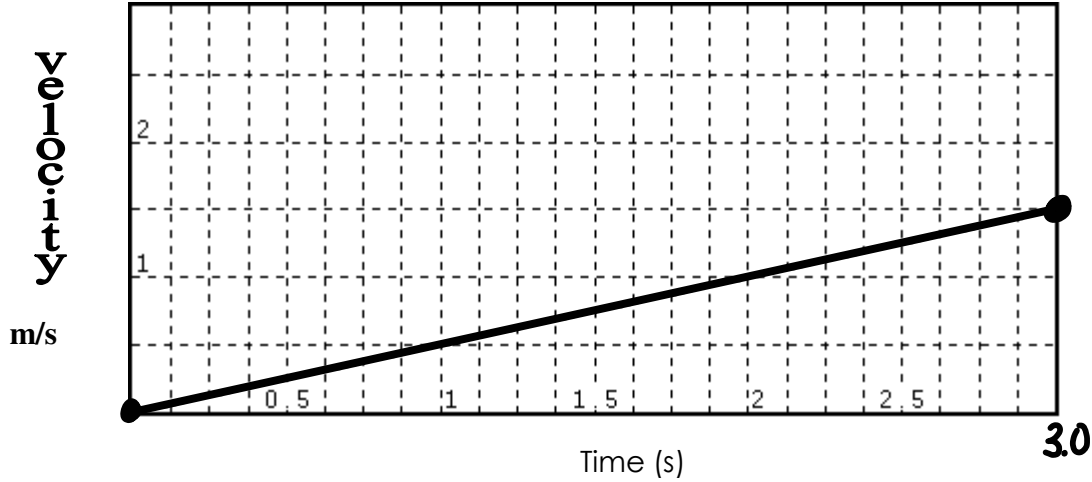
$$\begin{aligned} v &= \frac{\Delta d}{\Delta t} = \text{slope} \\ &= \frac{10 - 0}{5 - 0} \\ &= \boxed{2 \text{ m/s}} \end{aligned}$$

3) Find the velocity of the object in the graph below at 2.0 seconds (instantaneous velocity)



$$v = \frac{10 - 1.25}{3 - 1.5} = \frac{8.75}{1.5} = \boxed{5.83 \text{ m/s}}$$

4) Find the acceleration on the graph below and the distance travelled.

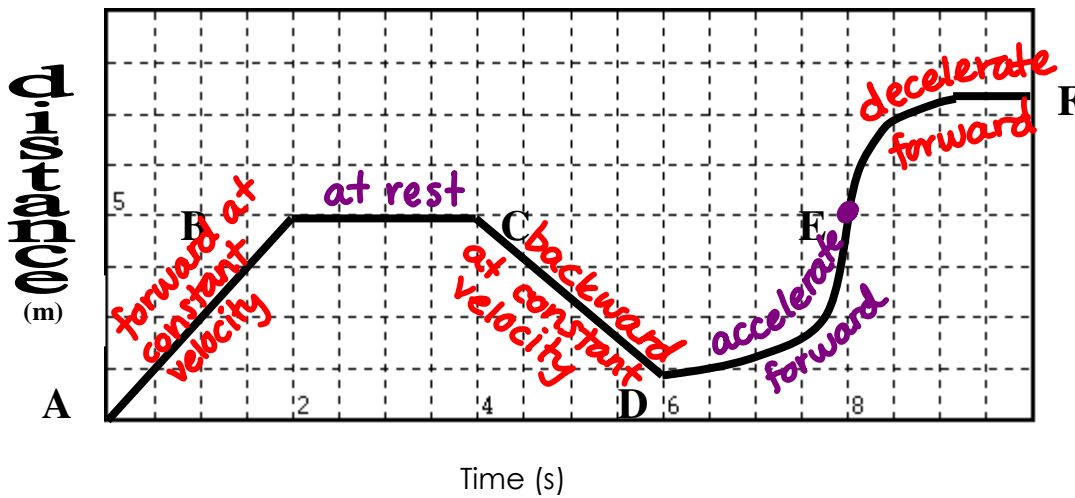


$$a = \frac{\Delta v}{\Delta t} = \text{slope}$$

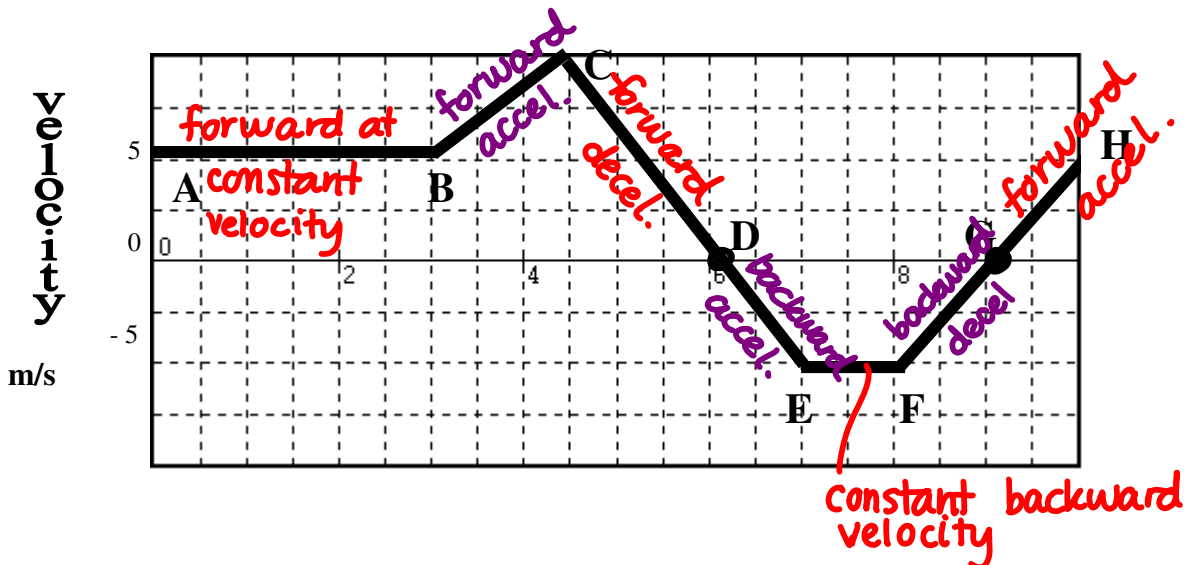
$$= \frac{1.5 - 0}{3.0 - 0}$$

$$= \boxed{0.5 \text{ m/s}^2}$$

5) Describe what the object is doing between each point on the graph, include direction



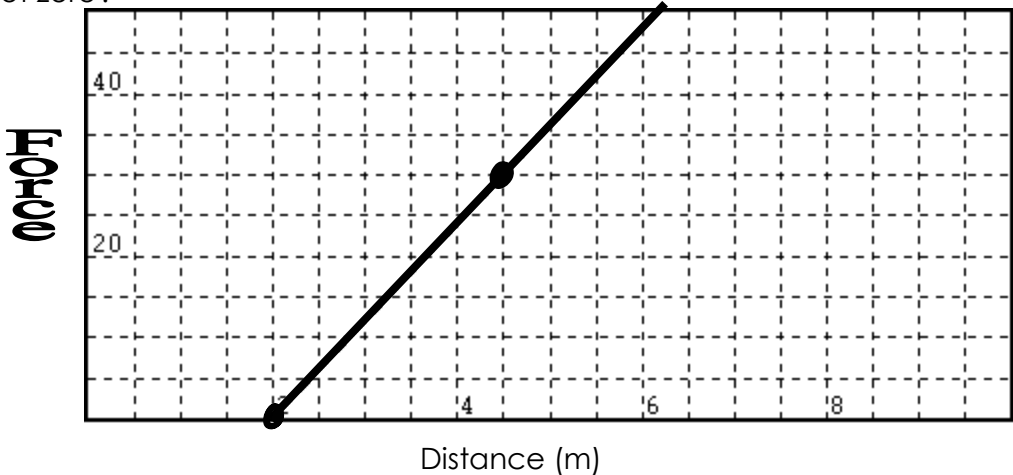
6) State what the object is doing between each point on the graph



7) What is the initial velocity in the previous graph?

5 m/s

8) On the following graph determine the spring constant include a unit calculation. Why is the x intercept not zero?

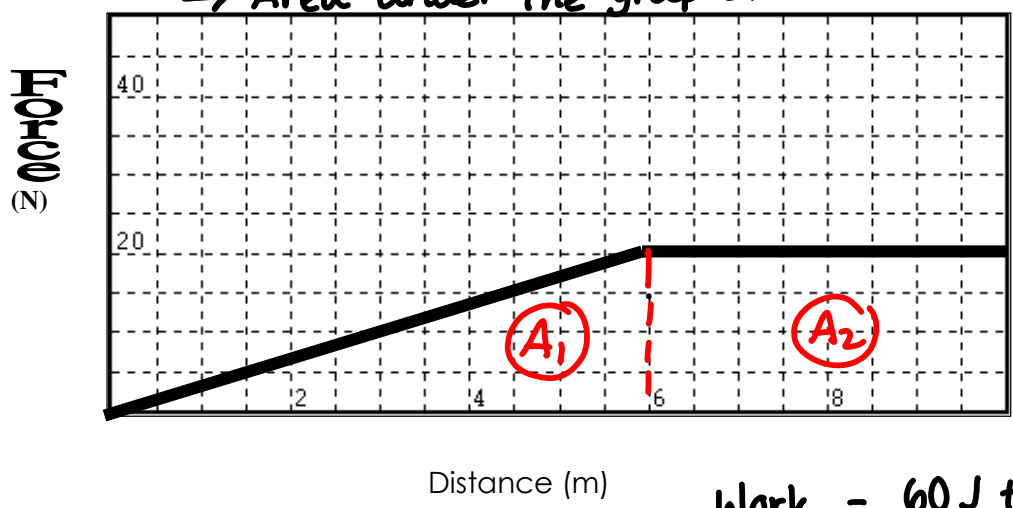


$$\begin{aligned}
 k &= \frac{\Delta F}{\Delta d} = \text{slope} \\
 &= \frac{30 - 0}{4.5 - 2} \\
 &= \frac{30}{2.5} = \mathbf{12 \text{ N/m}}
 \end{aligned}$$

The x-int isn't zero because the spring has a length even when not stretched.

9) What is the work done in the graph below?

↳ Area under the graph.



$$\begin{aligned}
 A_1 : & \\
 & \frac{1}{2}(6\text{m})(20\text{N}) \\
 & = 60 \text{ J} \\
 A_2 : & \\
 & (4\text{m})(20\text{N}) \\
 & = 80 \text{ J}
 \end{aligned}$$

$$\begin{aligned}
 \text{Work} &= 60 \text{ J} + 80 \text{ J} \\
 &= \mathbf{140 \text{ J}}
 \end{aligned}$$

10) On a graph of F_f vs. F_n what physical quantity does the slope represent? What are its units?

The slope represents the **coefficient of friction** (μ). It has no units.