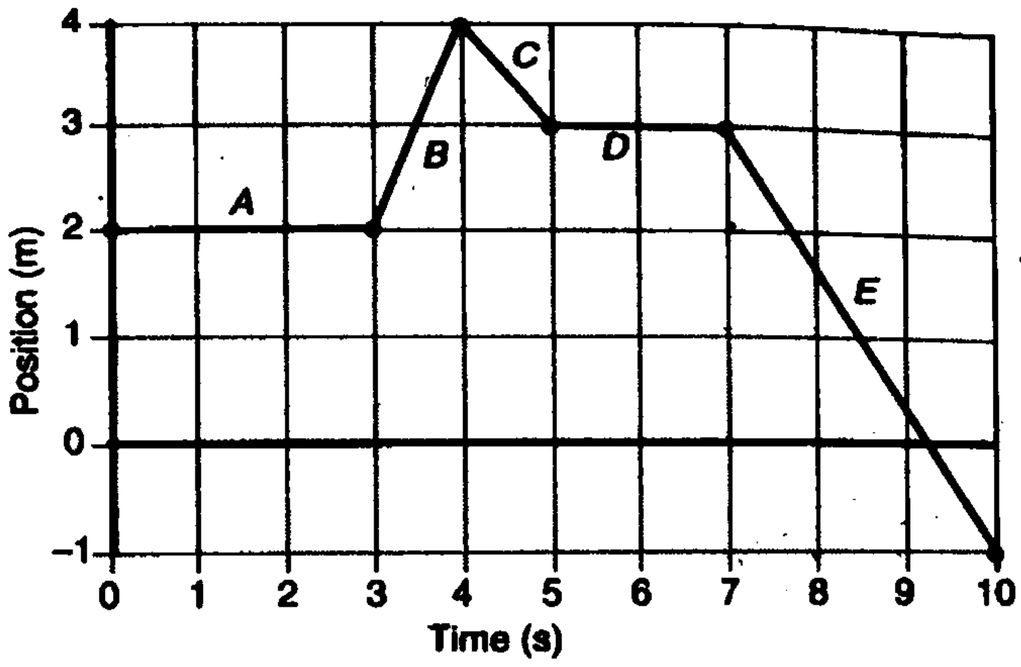
NAME: KEY DATE: _____

PHYSICS - Mr. Smith

# DT, VT and AT Graph Practice

The following illustrates the position of an object over time:




| 1/2 | $\vec{d}$ (m) | $\vec{v}$ (m/s) |
|---|---|---|
| A | 0 | 0 |
| B | +2 | +2 |
| C | -1 | -1 |
| D | 0 | 0 |
| E | -4 | $-\frac{4}{3}$ |

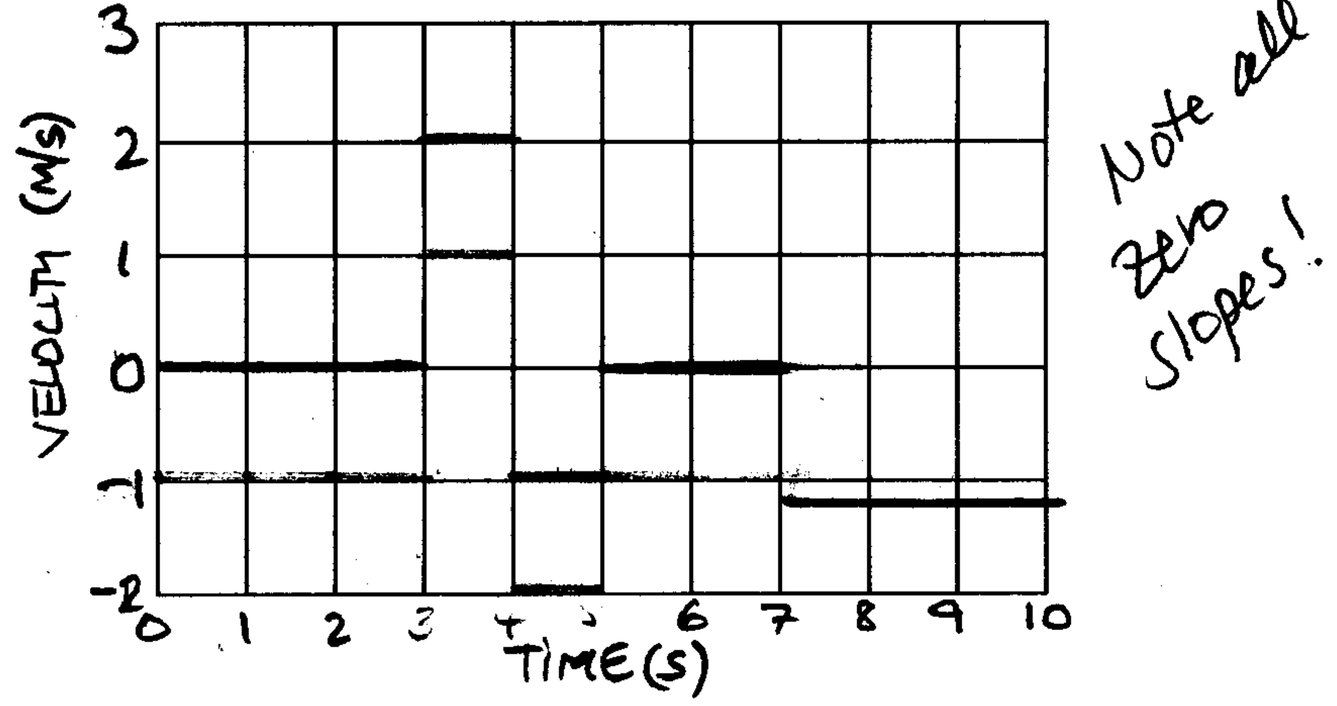
3) $\vec{d} = \vec{d}_f - \vec{d}_i$

$= -1 - 2 = \boxed{-3\text{m}}$

4) $\vec{v} = \frac{\Delta \vec{d}}{\Delta t} = \frac{\vec{d}_f - \vec{d}_i}{t_f - t_i}$

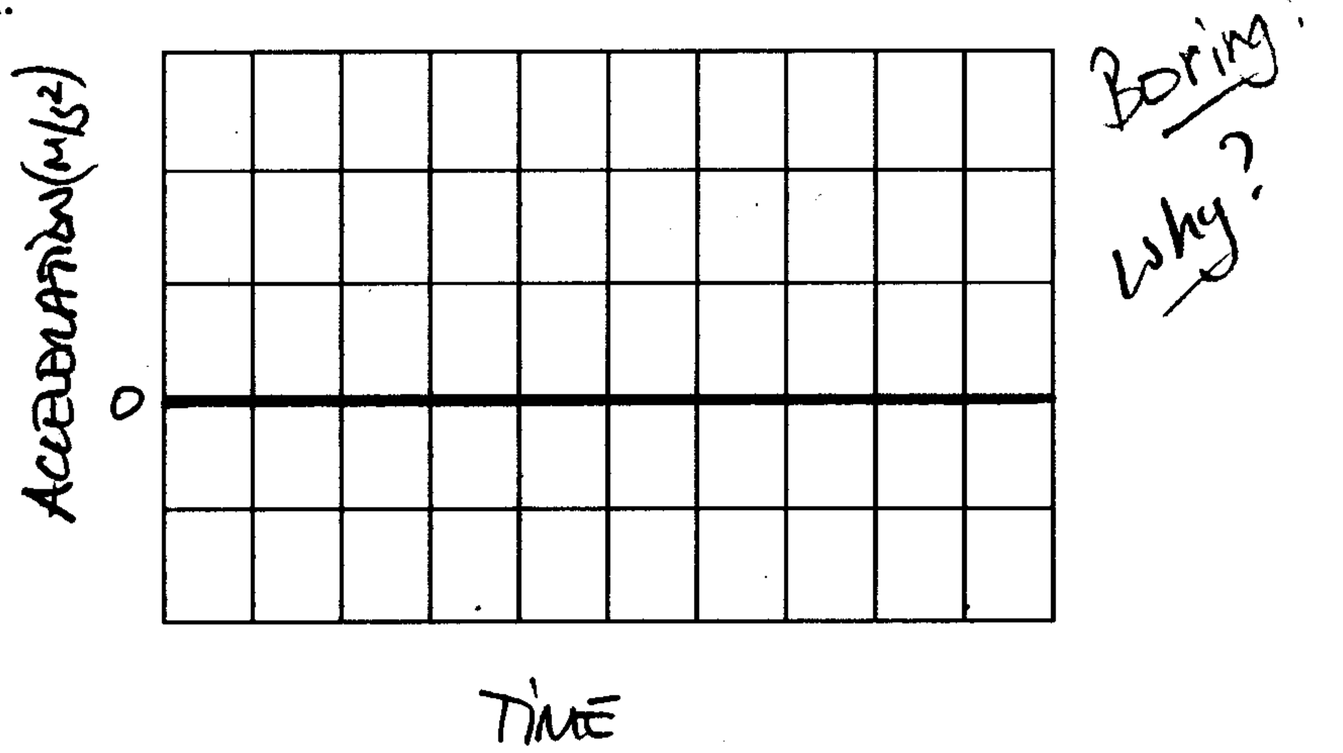
$= \frac{-3\text{m}}{10\text{s}} = \boxed{-0.3\text{m/s}}$

1. What is the displacement over each section of the graph?
2. What is the velocity over each section of the graph?
3. What is the displacement over the entire trip (0–10 seconds)?
4. What is the average velocity over the entire trip (0–10 seconds)?
5. Construct a VT graph of this motion:




Note all Zero Slopes!

6. Construct an AT graph of this motion:



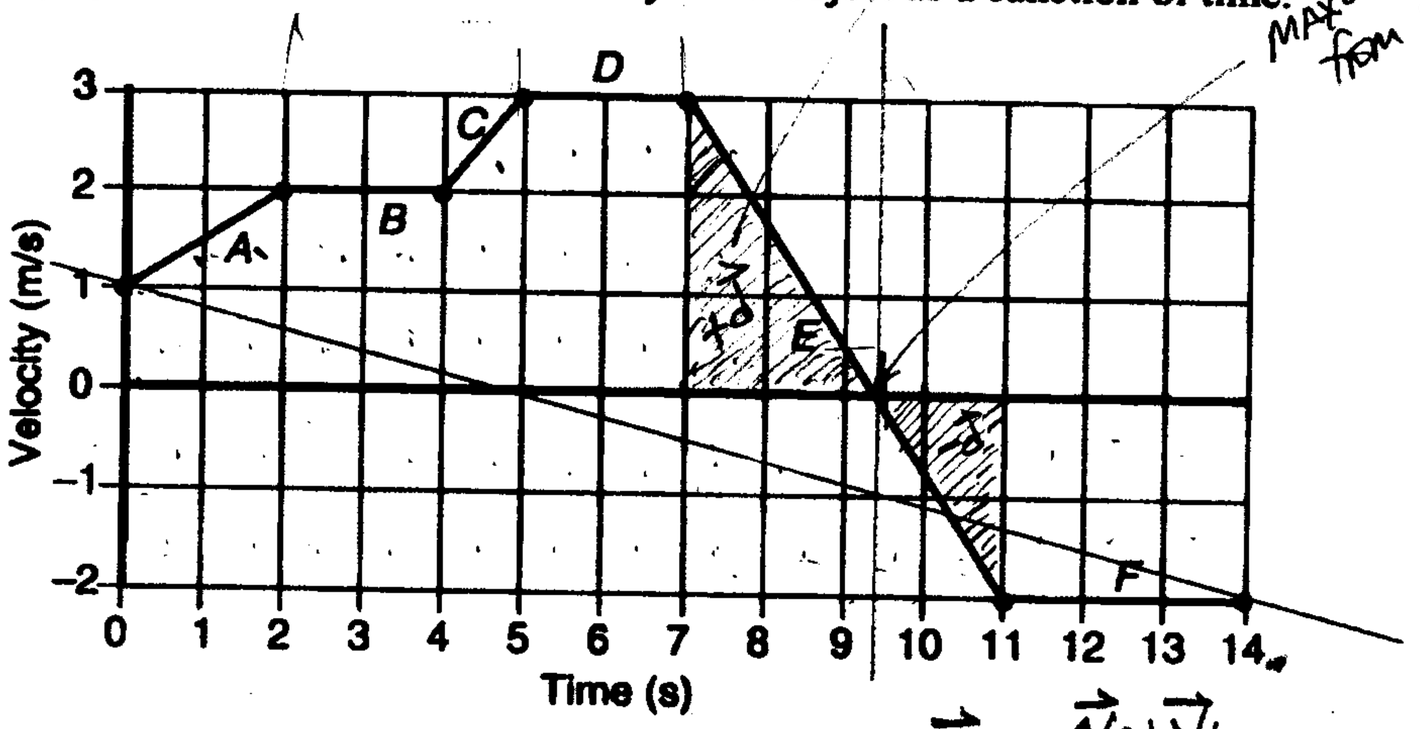

Boring! Why?

| 1/2 | $\vec{d}$ (m) | $\vec{\bar{v}}$ (m/s) | $\vec{a}$ (m/s²) |
|---|---|---|---|
| A | +3 | +1.5 | $+\frac{1}{2}$ |
| B | +4 | +2 | 0 |
| C | +2.5 | +2.5 | +1 |
| D | +6 | +3 | 0 |
| E | +2 | +½ | $-5/4$ |
| F | −6 | −2 | 0 |

3.5 blocks.

MAX distance from origin = 19m.

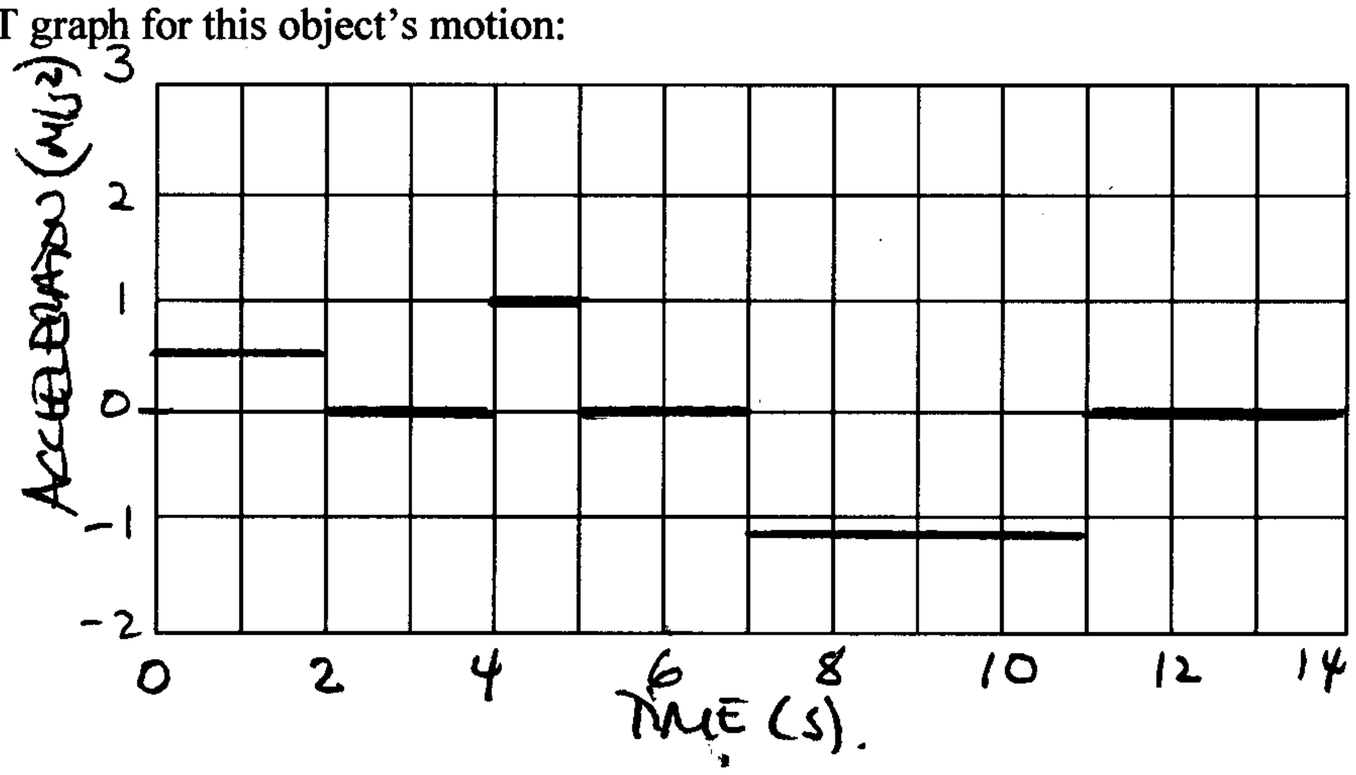
**The graph below illustrates the velocity of an object as a function of time.**




$\vec{\bar{v}} = \frac{\vec{v}_f + \vec{v}_i}{2}$

1. **What is the average velocity within each section of the graph?**
2. **What is the acceleration within each section of the graph?**
3. **When does the object come to rest?** ~9.3s
4. **When does the object reverse the direction of its motion?** ~9.3s Calculate it? (using $\vec{v}_f = \vec{v}_i + \vec{a}t$)
5. **What is the displacement within each section of the graph?** Calculate: $d = \vec{\bar{v}}t$
6. **What is the displacement over the entire trip (0–14 seconds)?** AREA under graph
7. **What is the average velocity over the entire trip (0–14 seconds)?** +0.82 m/s $\frac{d_{TOT}}{t}$ OR $=$
8. **What is the shape of the corresponding *acceleration versus time* graph?**

**9.** Sketch an AT graph for this object's motion:




**10.** Sketch a DT graph for this object's motion: ASSUME OBJECT STARTS AT d = 0.