Study Guide PHYSICS FOR test One Quarter One…..*SOME ANSWERS!!!!! (NOT COMPLETE!!)*
See if you can answer: (use graph paper if needed)

What's the difference between an observation and a measurement of a physical property?
Observation: an adjective, factual, objective….
Measurement: a comparison to standard or scale that uses a number and unit.

What's a standard for a unit of measure?
THE one thing that all is compared to…. Preferably a non changeable object or measurement.
What are the three fundamental properties of physics and their English & metric units?
Mass: Kg   TIME: sec   DIS(placement): Meters

Convert a car that accelerates 10 inches/sec^2 to miles/hour per second.
10 in | 1ft | 1 mile | 3600 sec   =   0.568 miles
sec•sec | 12 in |5280 ft | 1 hr   hour • sec

Describe the difference between accuracy and precision in an experiment.
Accuracy: close to right answer, precision: repeatable, # digits

Estimate to within a power of ten the number of pencils that would fit in my teacher's desk.
*3 ft * 2 ft * 8ft | 12 in * 12 in * 12 in | 1 pencil   = 345, 600 pencils*
*1 desk | 1 ft * 1 ft * 1 ft | 6 in * .2in*.2 in   desk*

Identify the control group, experimental group, independent and dependent variables in an experiment to test the effects of gravity on plant growth.
CG: Plant in zero g, EG: Plant in Gravity, IV: Gravity, DV: Height

Describe the difference between distance and displacement.
Distance: always positive, displacement: distance with direction from start
Describe how to calculate average speed, velocity.
Average speed = Abs Value of Velocity. Average velocity = Change in Dis/Change in time
Describe the meaning and units for speed, velocity and acceleration.
Speed = Abs Value of Velocity Units are m/s,   Acceleration is Change in Vel/Change in Time units are m/s^2, Jerk is Change in Accleration/Time units are m/s^3
Describe how to get velocity from a displacement time graph.
Slope!
Describe how to get displacement and acceleration from a velocity time graph.
*Displacement = AverageVel* time or area of V-T graph*
Acceleration = Slope of V-T graph.

Be able to use the definitions of velocity and acceleration to solve for dis and time.

Describe the shape of a displacement time and velocity time graph for an object: at rest, going fast forwards, going slow backwards, speeding up going forwards and backwards, speeding up going backwards.
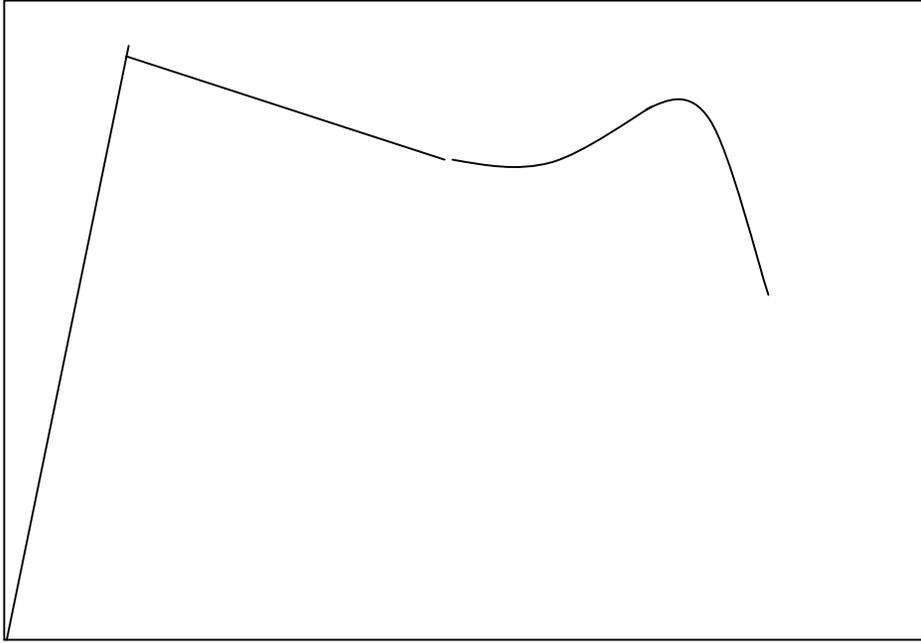
D-T
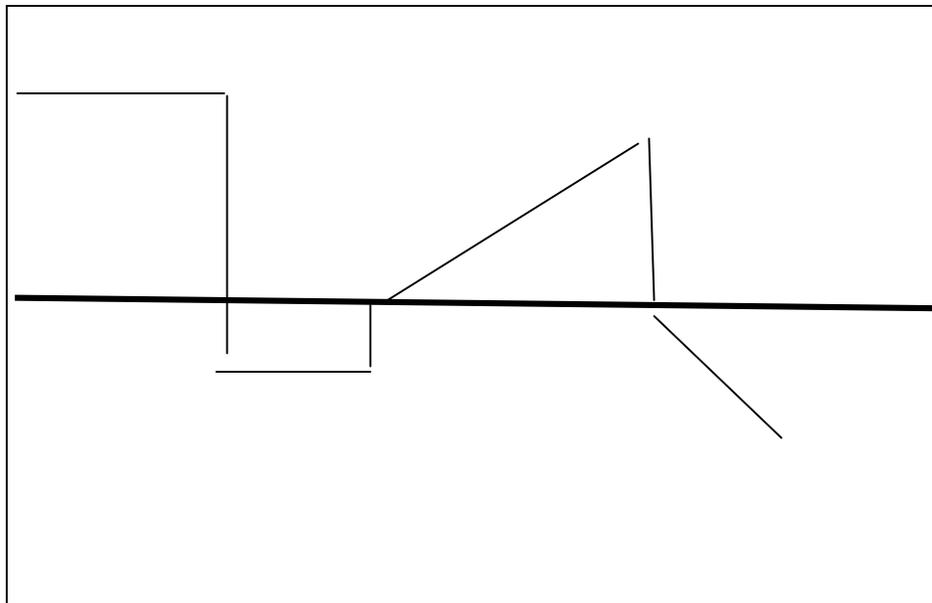
V-T

Use an accurate D-T graph to answer this question.
While jogging, Maria sees Jason 10 m ahead of her, walking in the same direction. If Maria is jogging at 5.0 m/s and Jason is walking at 2.0 m/s, how long will Maria have to jog before catching up to Jason?
Time: 3.33 sec, Dis: 16.67 m
When velocity is negative and acceleration is positive, what happens to the object's motion?
The object decreases speed going backwards, then increases speed going forwards. (changes direction)
When velocity is positive and acceleration is negative, what happens to the object's motion? *The object decreases speed going forwards, then increases speed going backwards. (changes direction)*

Make a V-T table then draw an accurate V-T graph for this: A police car at a stoplight accelerates at 0.5 m/s². A truck goes a constant 2 m/s.
When will their velocities be equal? How far has each one gone?
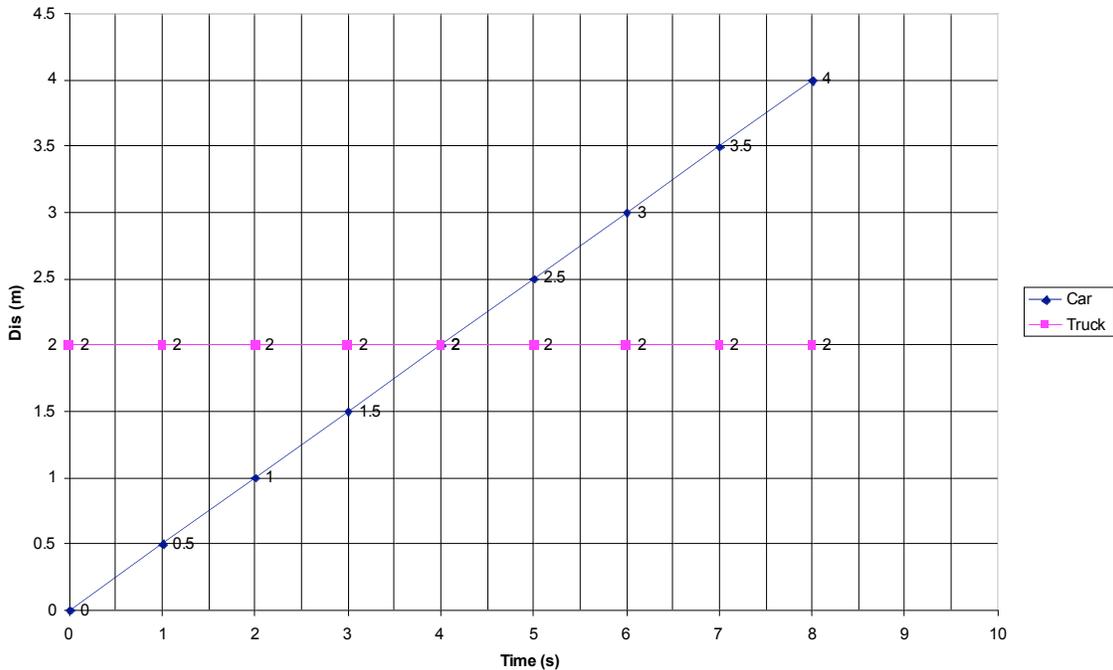*At time = 4 sec, their velocities are both 2 m/s. The truck has gone D=VavgT=2*4sec=8m.*
The car has gone D=VavgT= (2+0)/2*4sec or 1/2b*h=4m.
When will their displacements be equal? (use area on the V-T graph)
At time = 8 sec, both have gone 16 m. The car has gone D=VavgT= (4+2)/2*4=3m/s*4s=12m MORE for a total of 12+4=16m.
Or, it is one big triangle (1/2 (8)*4)=16m area

Stoplight

Find the velocity for each section of the D-T graph. Find the average velocity of the whole trip. (Dis points: (0,0), (4.2,6),(7,8.8),(11.2,8.8),(15.5,2.9))
Slope of each section change in dis/change in time.=Velocity
Vavg for whole trip = Dis/Time = (2.9-0)/(15.5-0) = 0.187 m/s

Find the displacement and acceleration for each section of the V-T graph. Find the average velocity of the whole trip. (Vel points: (0,+1.9), (3,+1.9), (4.8, +2.4), (7,0), (8.2, -1.2), (10.5, 0))
Slope of each section , change in velocity /change in time is acceleration.
Average Acceleration for whole trip = (0-1.9)/(10.5-0)= -0.18 m/s²

Displacement = Area of each section……. Flat section has area of 1.9*3=5.7m, next positive section area of about 5.3 m for a total positive displacement of 11m, then the negative section area is about -3.5 m.
So the whole trip has a displacement of about +7.5 m total. The average velocity for the whole trip is Change in Dis/Time so 7.5m/10.5= 0.71 m/s

Dis (m)

D- Time (sec)

Vel (m / s)

Time (sec)