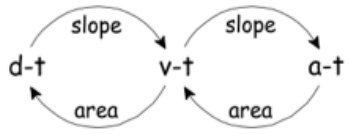
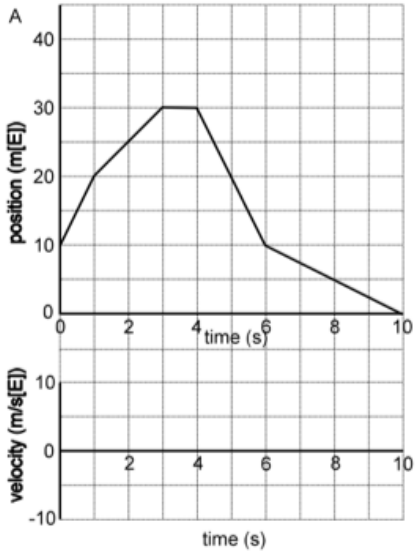
**d-t, v-t, a-t graph**

1. The following graphs represent trips performed in several stages. Use the graph given to construct the graph required. You may find the diagram to the right useful for remembering what you need to do.

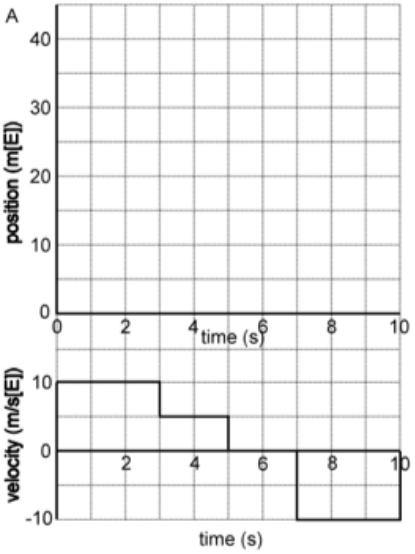



Remember that area is cumulative!

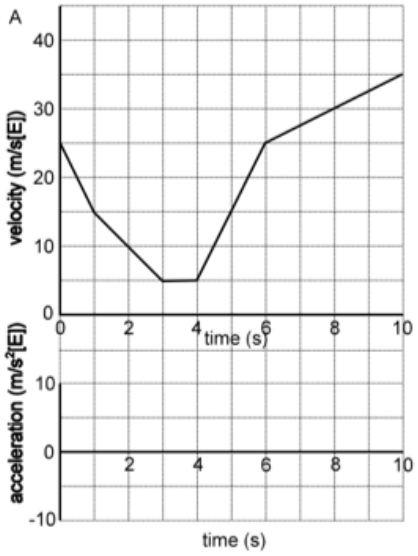
d-t ➡ v-t



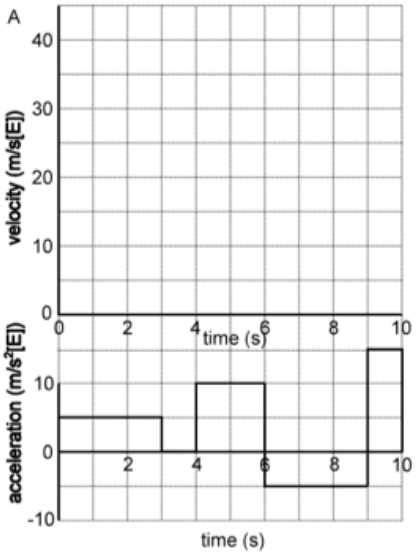

v-t ➡ d-t




v-t ➡ a-t




a-t ➡ v-t



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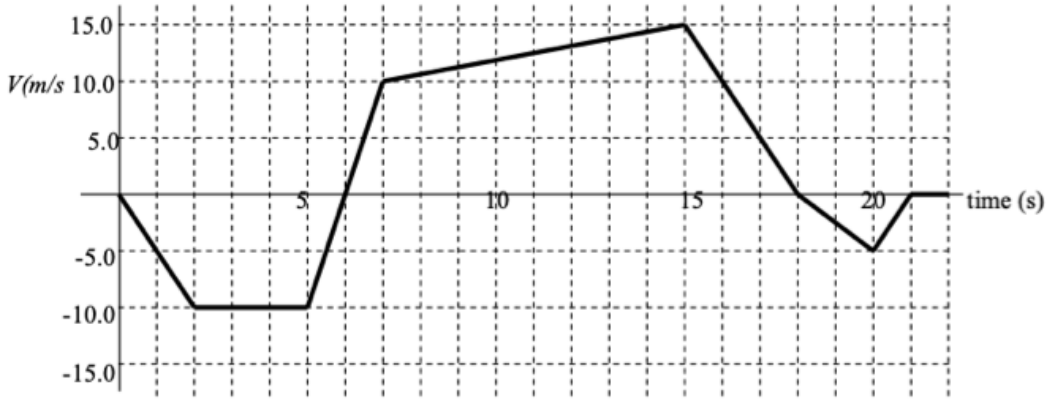
Motion Graphs & Kinematics Worksheet:

1. The graph below describes the motion of a fly that starts out going left.




a. Identify section(s) where the fly moves with constant velocity.

b. Identify section(s) where the fly moves right slowing down.

c. Identify section(s) where the fly moves left speeding up.

d. When is the fly at rest?

e. What is the average velocity of the fly between 0 and 15 seconds?

f. What is the **distance** traveled by the fly in this time interval?

g. What is the average **speed** of the fly in the same time interval?

h. What is the average acceleration of the fly in this time interval?

i. What is the total displacement of the fly from 0 to 22 seconds?

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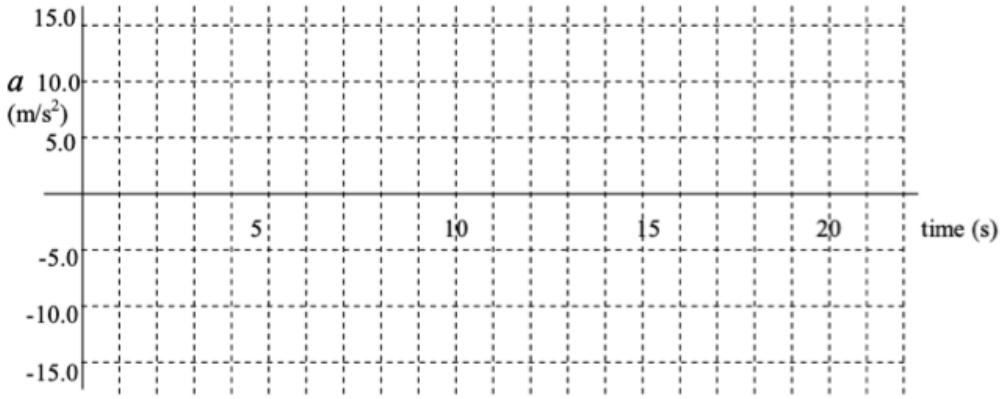
j. Identify the times when the fly changes direction.

k. Draw an acceleration vs. time graph for the fly.

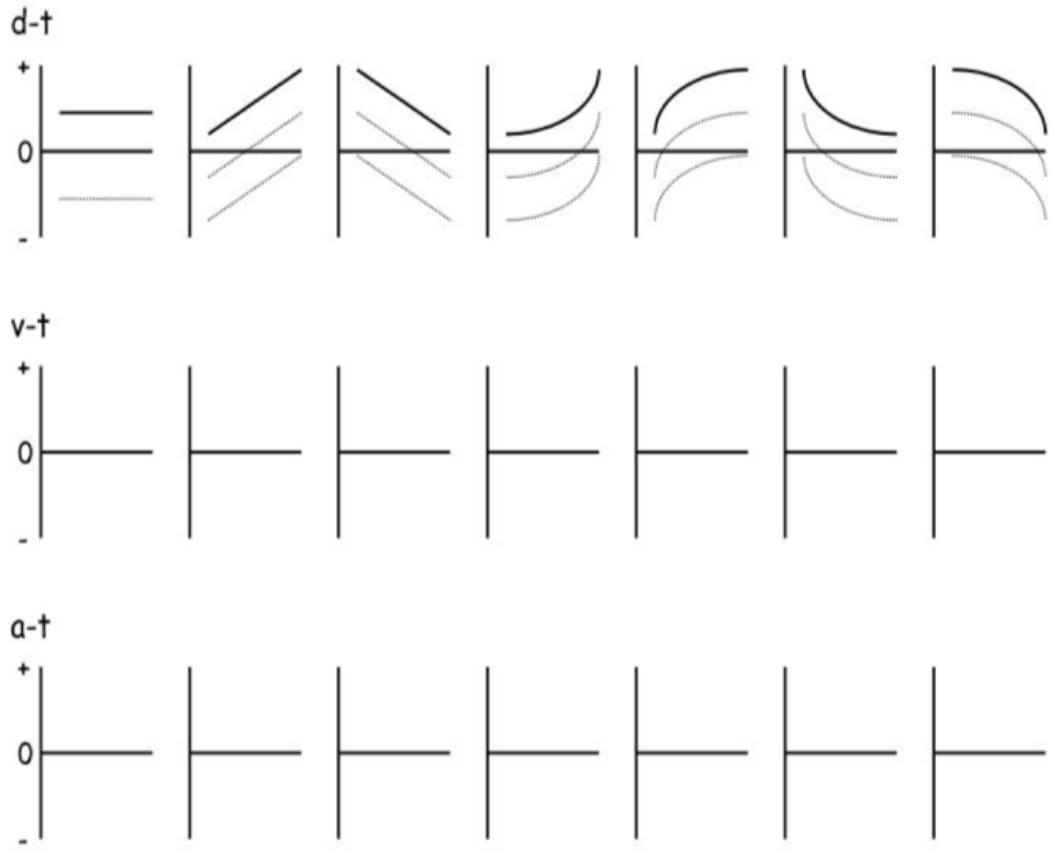


# Motion Graphs

## Sketching Graphs

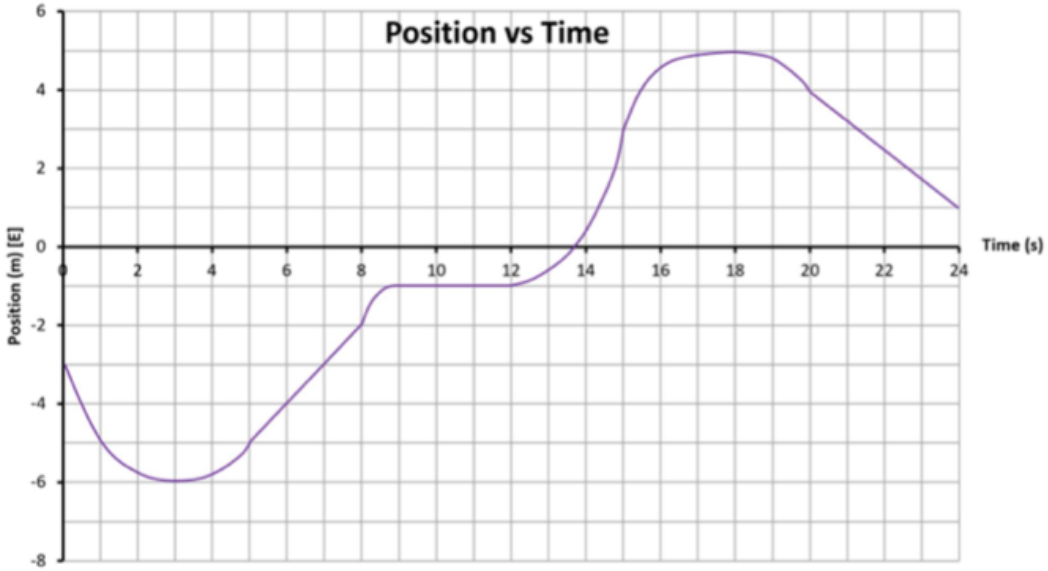
For each of the following, sketch the corresponding v-t and a-t graphs, for both the solid and dotted lines.

Is there a difference between the graphs for the solid and dotted lines? Explain.



**Position vs. Time Graphs - Practice**

Given the following position vs time graph:




a) At what time(s) was the object stopped?
b) At what time(s) did the object have a velocity of 0, but was not stopped?
c) At what time(s) did the object return to its starting position?
d) During which time interval(s) was the object moving east?
e) During which time interval(s) was the object moving west?
f) During what time interval(s) did the object have a constant speed?
g) During what time interval(s) was object speeding up?
h) During what time interval(s) was object slowing down?
i) Write a paragraph describing the object's journey, indicating the interval of time, the direction the object was travelling during that interval of time and what was happening to the object's speed during that interval (was it speeding up, slowing down, or travelling at a constant velocity?)
j) What was the instantaneous velocity of the object at the following times? Round your answers to 2 decimal places.
    i) 2.0 s
    ii) 12.0 s
    iii) 16.0 s
k) What was the average velocity of the object during the following time intervals? Round your answers to 2 decimal places.
    i) 0.0 s to 5.0 s
    ii) 5.0 s to 15.0 s
    iii) the entire journey
l) What was the average speed of the object during the following time intervals? Round your answers to 2 decimal places.
    i) 0.0 s to 5.0 s
    ii) 5.0 s to 15.0 s
    iii) the entire journey

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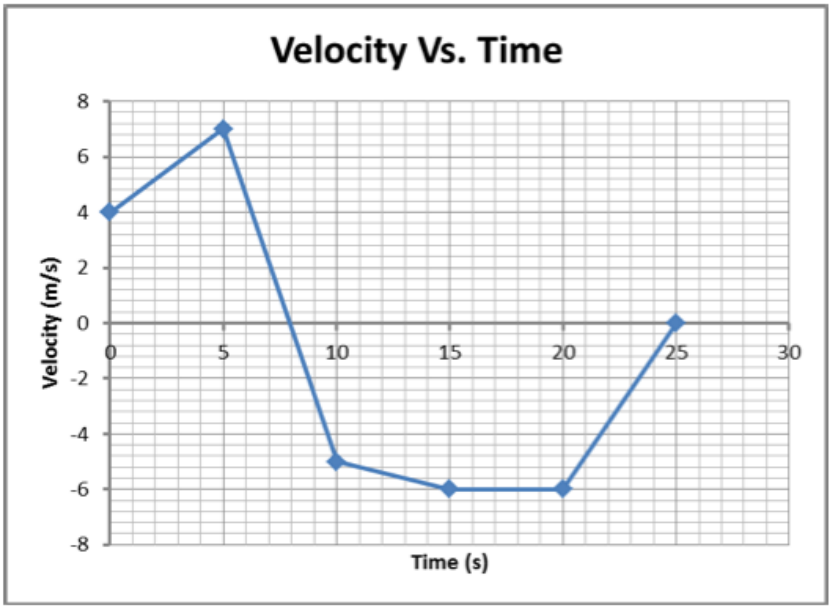
2. The motion graph shown below was created by a toy train which starts out moving north. The train starts from a position of 2.0m north.




a. What was the displacement of the train in 25 seconds?

b. What is its average velocity?

c. What is its average speed?

d. What is the average acceleration of the train?

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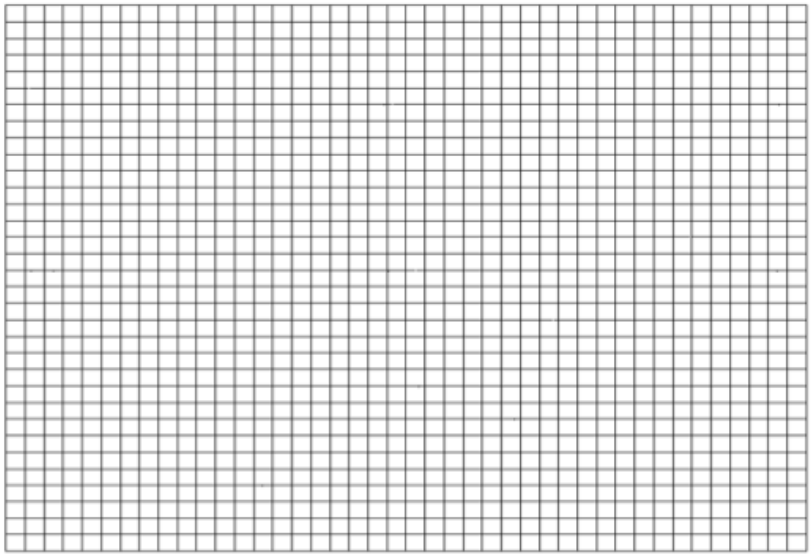
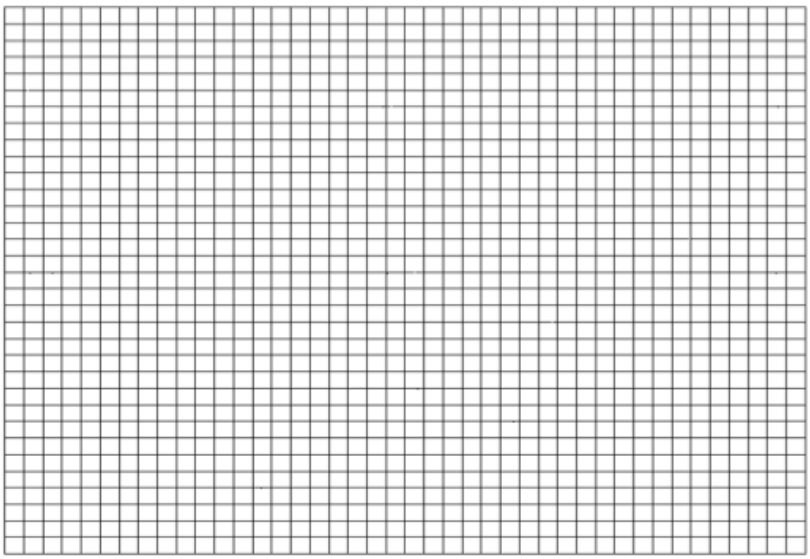
e. Draw the position vs. time graph for the toy train.

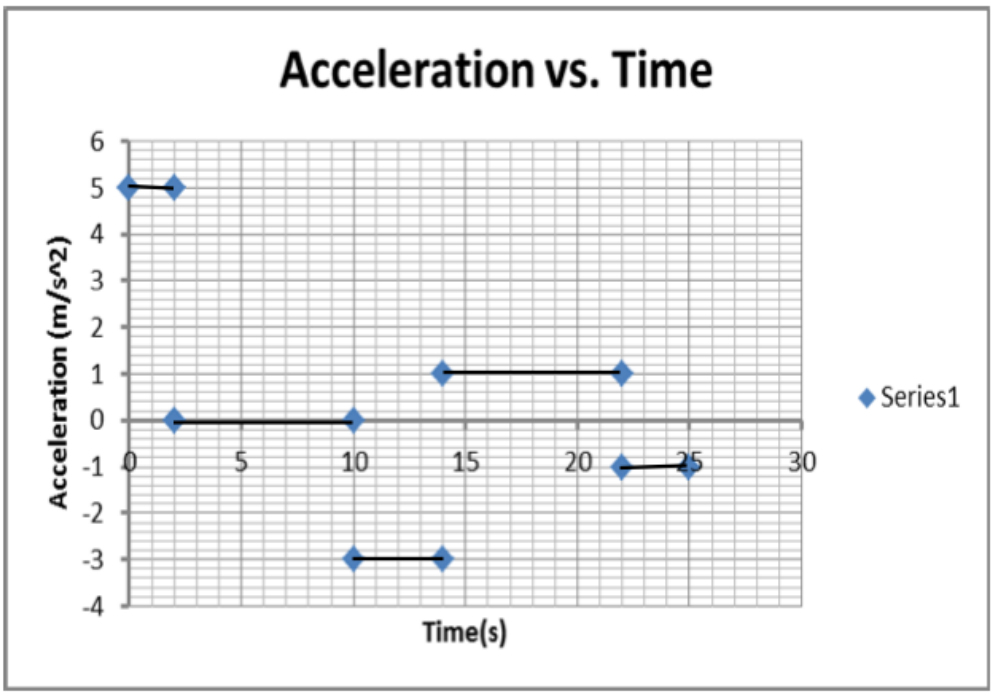


f. Draw the acceleration vs. time graph for the toy train.



Name:_____ Date:_____

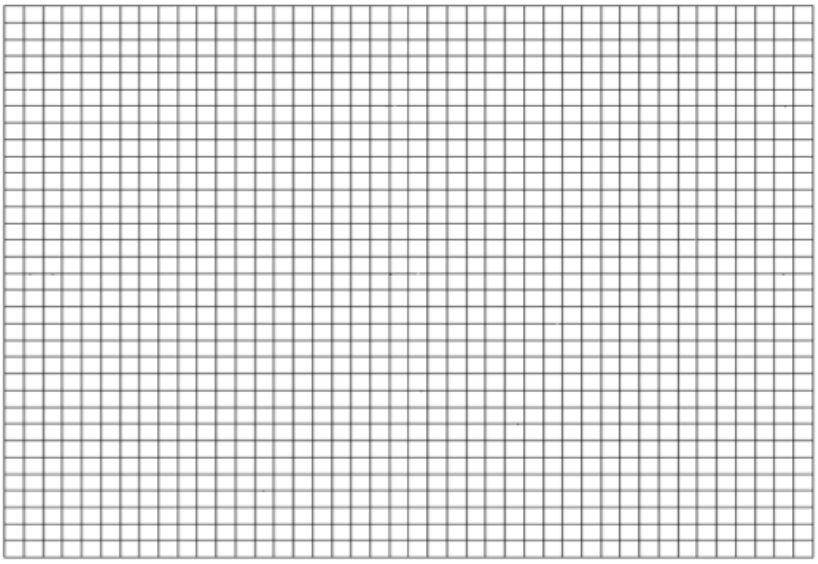
4.




The graph shown above is created by an object that starts at rest from the origin.

a. What is the average acceleration of the moving object?

b. Draw the velocity vs. time graph for the moving object.



Name:_____Date:_____

a. Draw the position vs. time graph for the moving object.