Name: _____

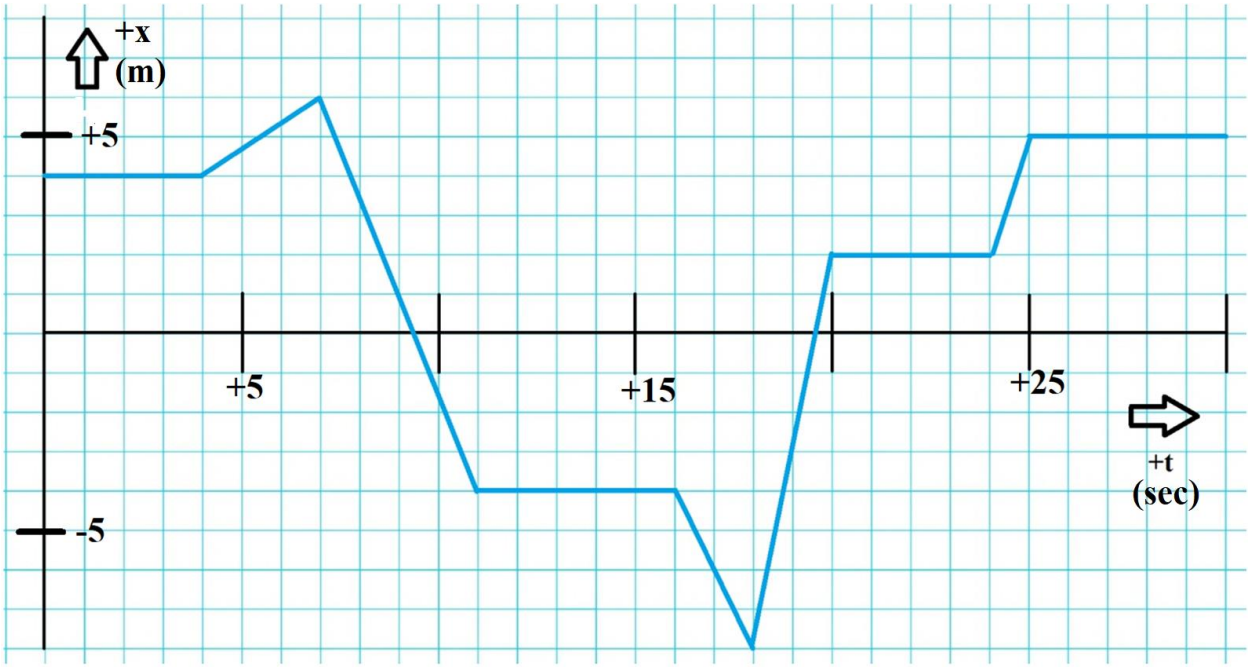
Class: _____

Due Date: _____

Physics Topic 3 - Graphing Horizontal Motion in One Dimension

Part 1: Answer the following questions. The solutions to this worksheet can be found on the YouTube channel Go Physics Go.

1. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *displacement vs. time* graph is shown below.



a. What does the slope of a *displacement vs. time* graph tell us?

b. Give all your solutions to two significant figures. Determine the *displacement* and *velocity* of the object during the following times:

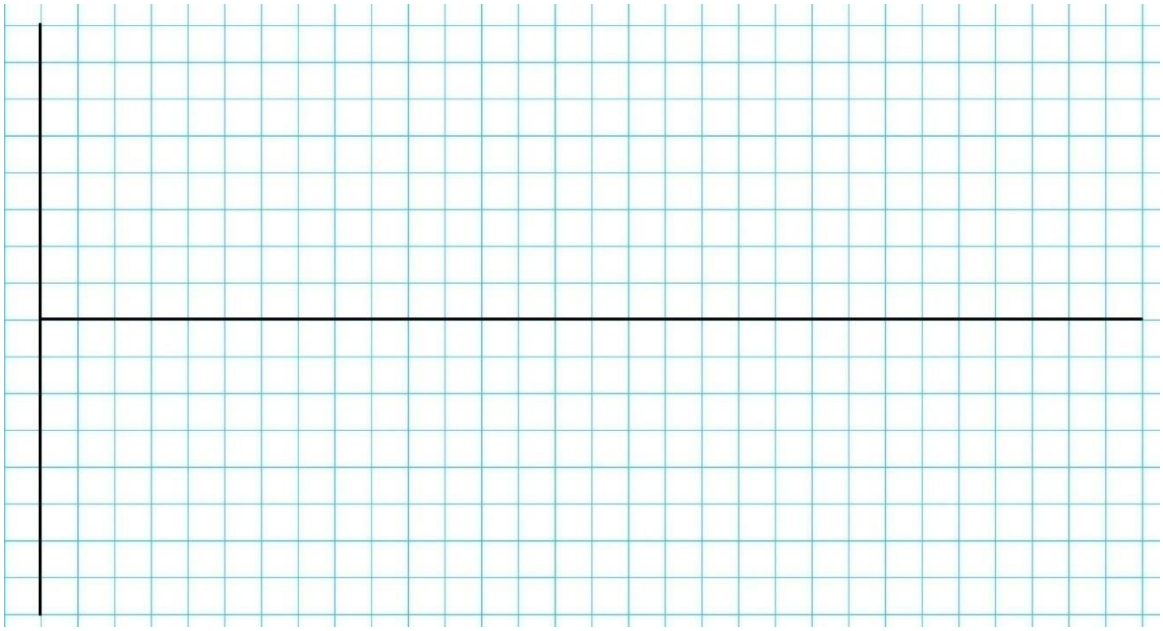
Time (s)	Displacement (m)	Velocity (m/s)
3.0		
5.0		
9.0		
13.0		
17.0		
19.0		
23.0		
24.5		
28.		

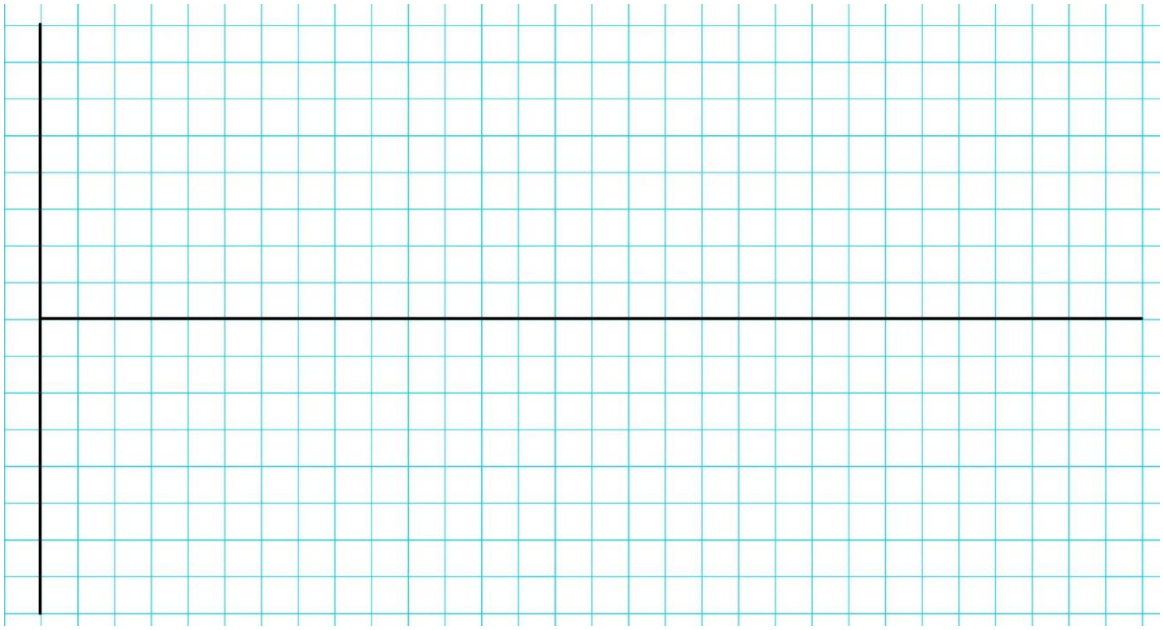
c. What is the *total distance* the object travels from $t = 0$ s to $t = 30.0$ s?

d. What is the *displacement* of the object from $t = 0$ s to $t = 30.0$ s?

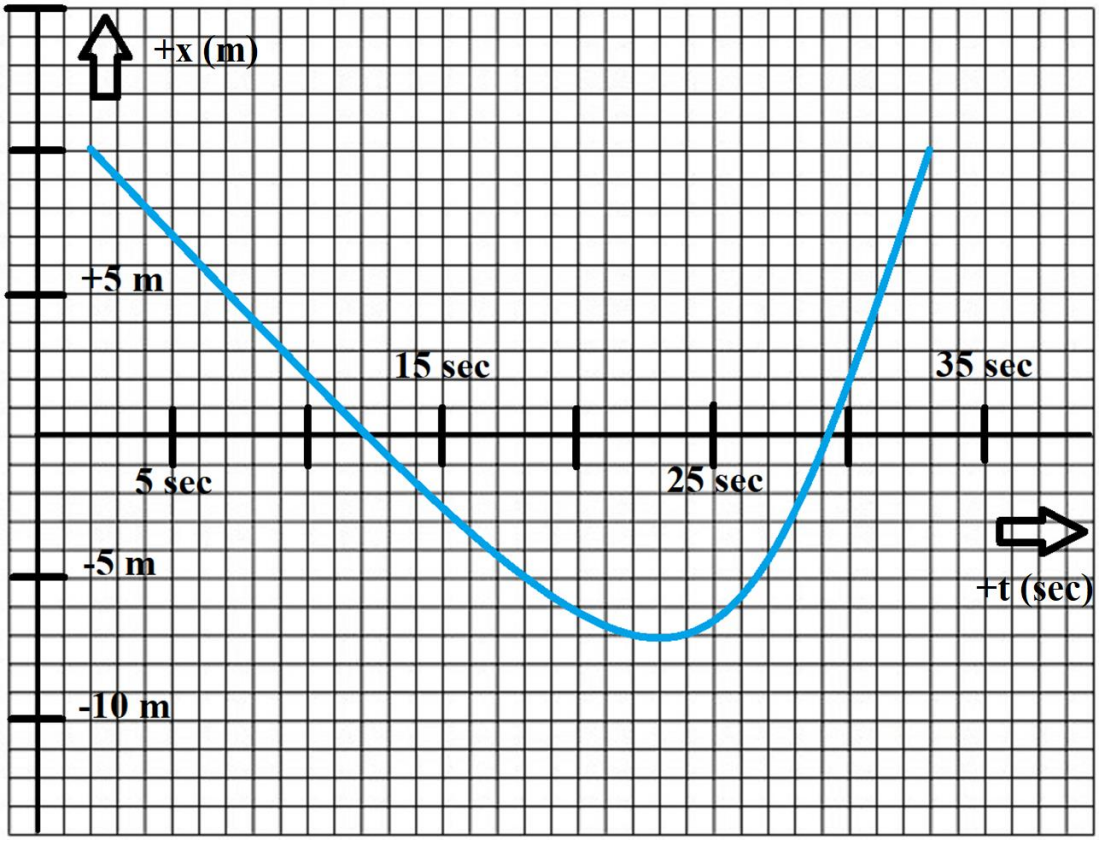
e. What does the slope of a *velocity vs. time* graph tell us?

f. **Use a pencil and ruler!** Draw a *velocity vs. time* graph and an *acceleration vs. time* graph. Label your axes!





2. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *displacement vs. time* graph is shown below.



a. Is the object moving to the left or the right? Is it speeding up or slowing down?

From $t = 2$ s to $t = 12$ s	
From $t = 12$ s to $t = 23$ s	
From $t = 23$ s to $t = 29$ s	
From $t = 29$ s to $t = 33$ s	

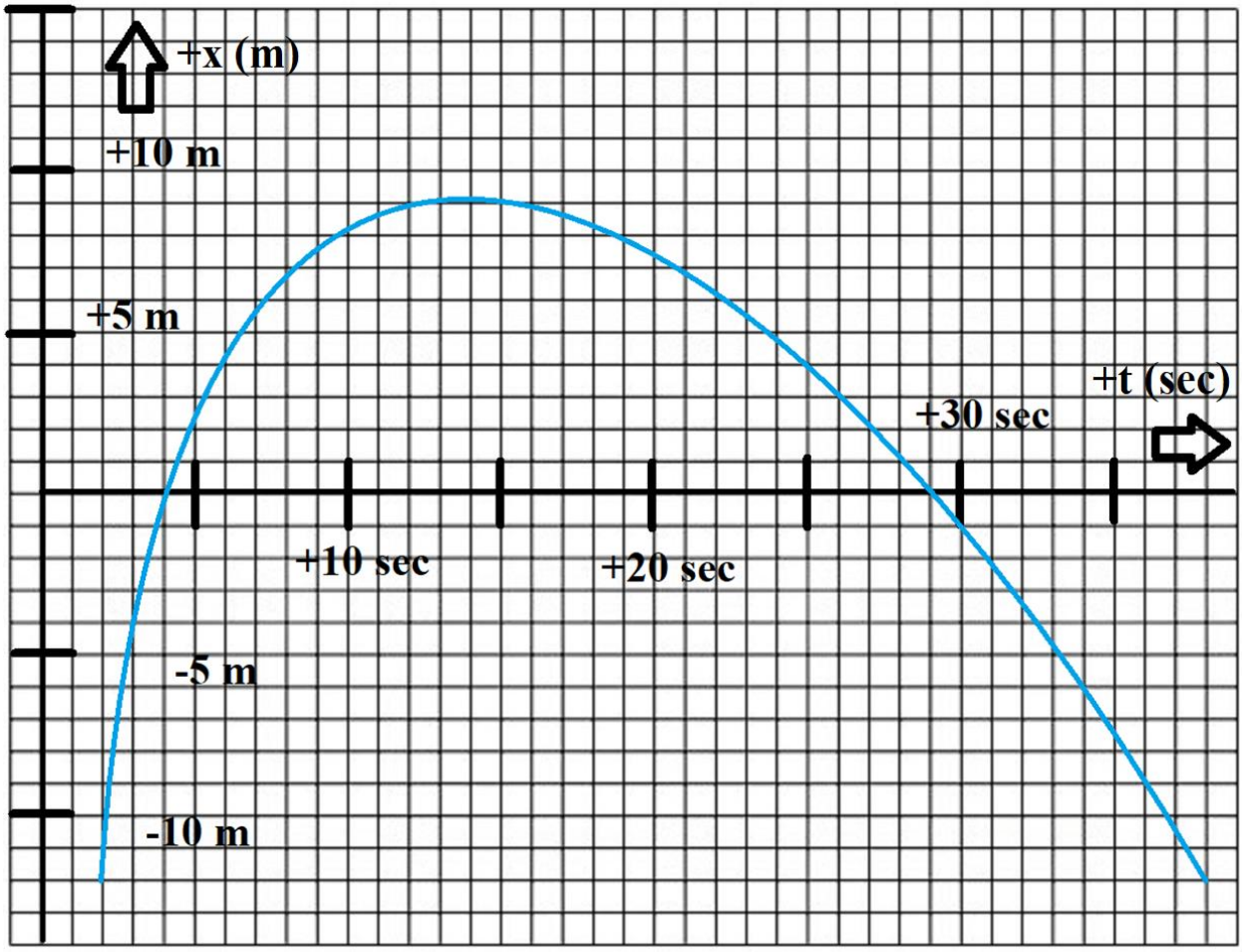
b. Give all your solutions to two significant figures. Determine the *displacement* and *velocity* of the object at

Time (s)	Displacement (m)	Velocity (m/s)
12.		
23.		
29.		

c. What is the *total distance* the object travels from $t = 2$ s to $t = 33$ s?

d. What is the *displacement* of the object from $t = 2$ s to $t = 33$ s?

3. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *displacement vs. time* graph is shown below.



a. Is the object moving to the left or the right? Is it speeding up or slowing down?

From $t = 2$ s to $t = 4$ s	
From $t = 4$ s to $t = 14$ s	
From $t = 14$ s to $t = 29$ s	
From $t = 29$ s to $t = 38$ s	

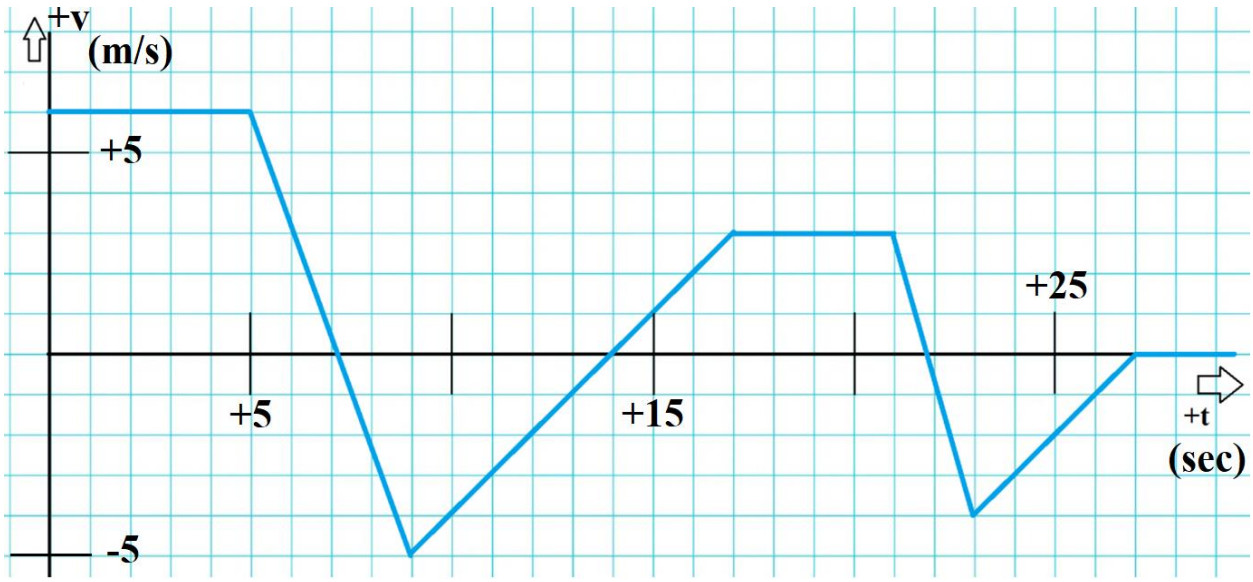
b. Give all your solutions to two significant figures. Determine the *displacement* and *velocity* of the object at

Time (s)	Displacement (m)	Velocity (m/s)
4.0		
14.		
29.		

c. What is the *total distance* the object travels from $t = 2$ s to $t = 38$ s?

d. What is the *displacement* of the object from $t = 2$ s to $t = 38$ s?

4. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *velocity vs. time* graph is shown below.



a. What does the slope of a *velocity vs. time* graph tell us?

b. Give all your solutions to two significant figures. Find the *velocity* and the *acceleration* of the object at

Time (s)	Velocity (m/s)	Acceleration (m/s^2)
3.0		
7.0		
8.0		
10.		
14.		
18.		
22.		
29.		

c. What does the area under a *velocity vs. time* graph tell us?

d. Find the *displacement* of the object from

i. $t = 0$ s to $t = 5$ s

ii. $t = 5$ s to $t = 9$ s

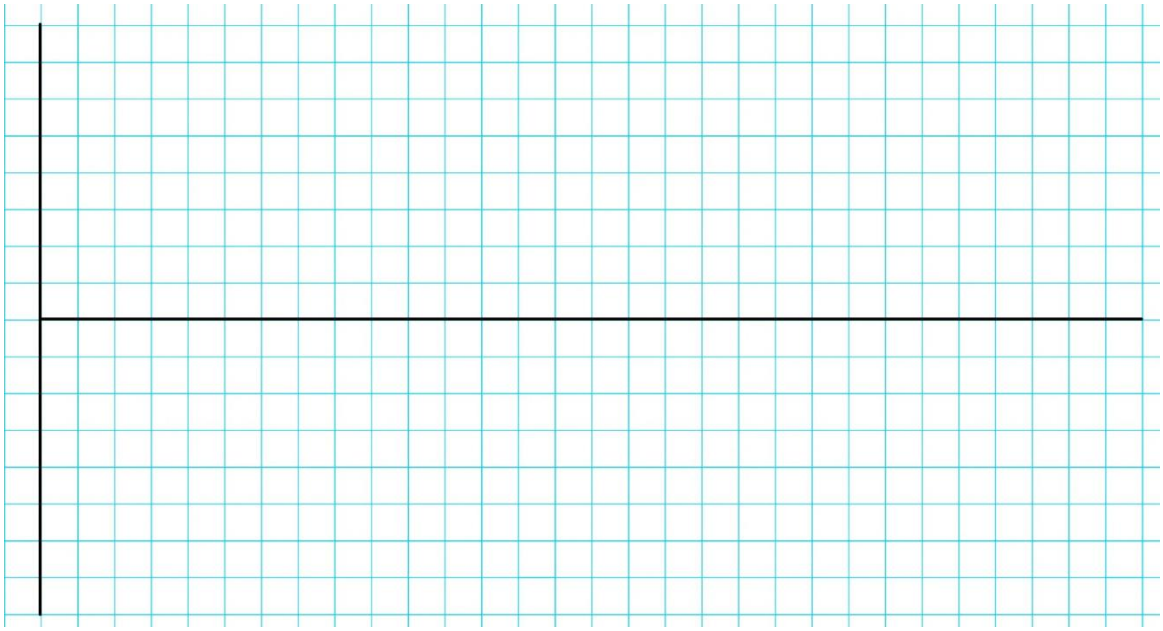
iii. $t = 9$ s to $t = 17$ s

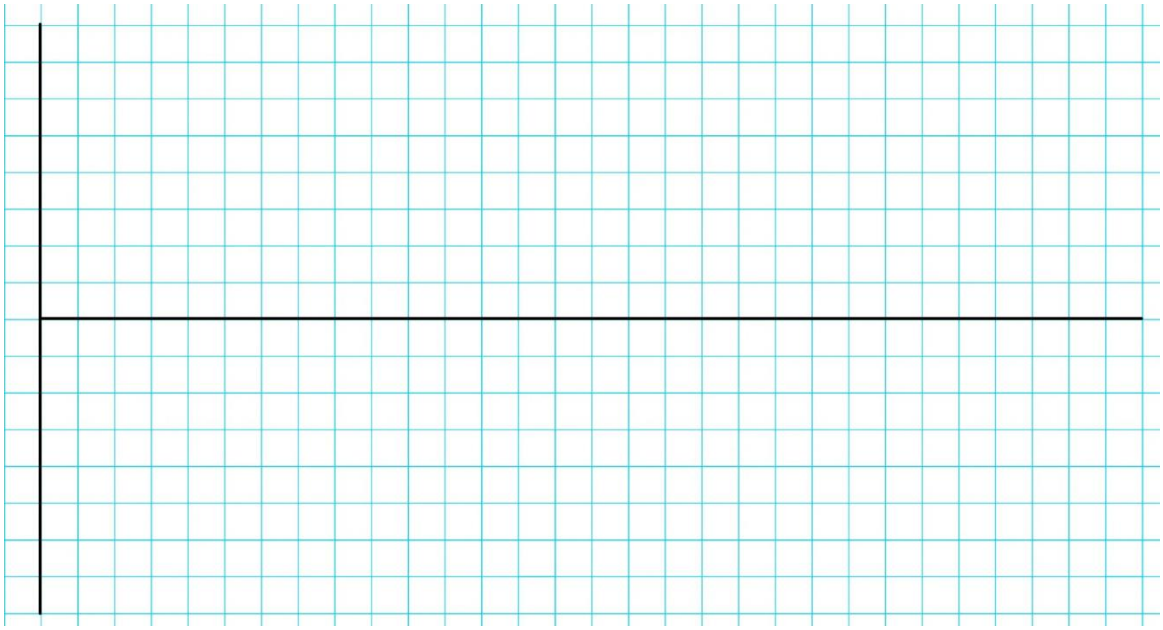
iv. $t = 17$ s to $t = 27$ s

e. Determine the *total distance* the object travels from $t = 0$ s to $t = 29$ s.

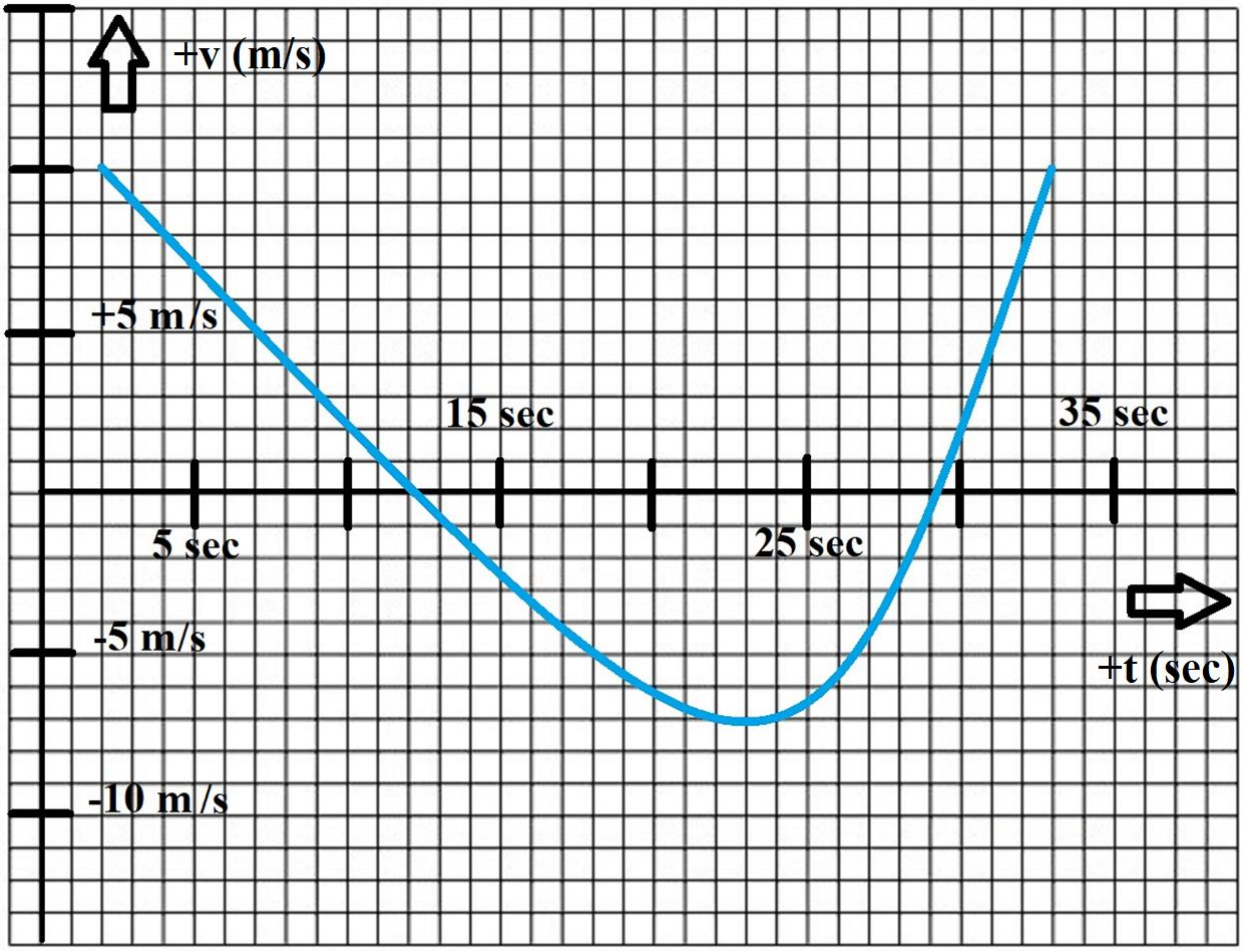
f. Determine the *displacement* of the object from $t = 0$ s to $t = 29$ s.

g. **Use a pencil and ruler!** Draw an *acceleration vs. time* graph and a *displacement vs. time* graph. Label your axes!





5. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *velocity vs. time* graph is shown below.



a. Is the object moving to the left or the right? Is its acceleration increasing, decreasing, or constant?

From $t = 2$ s to $t = 12$ s	
From $t = 12$ s to $t = 23$ s	
From $t = 23$ s to $t = 29$ s	
From $t = 29$ s to $t = 33$ s	

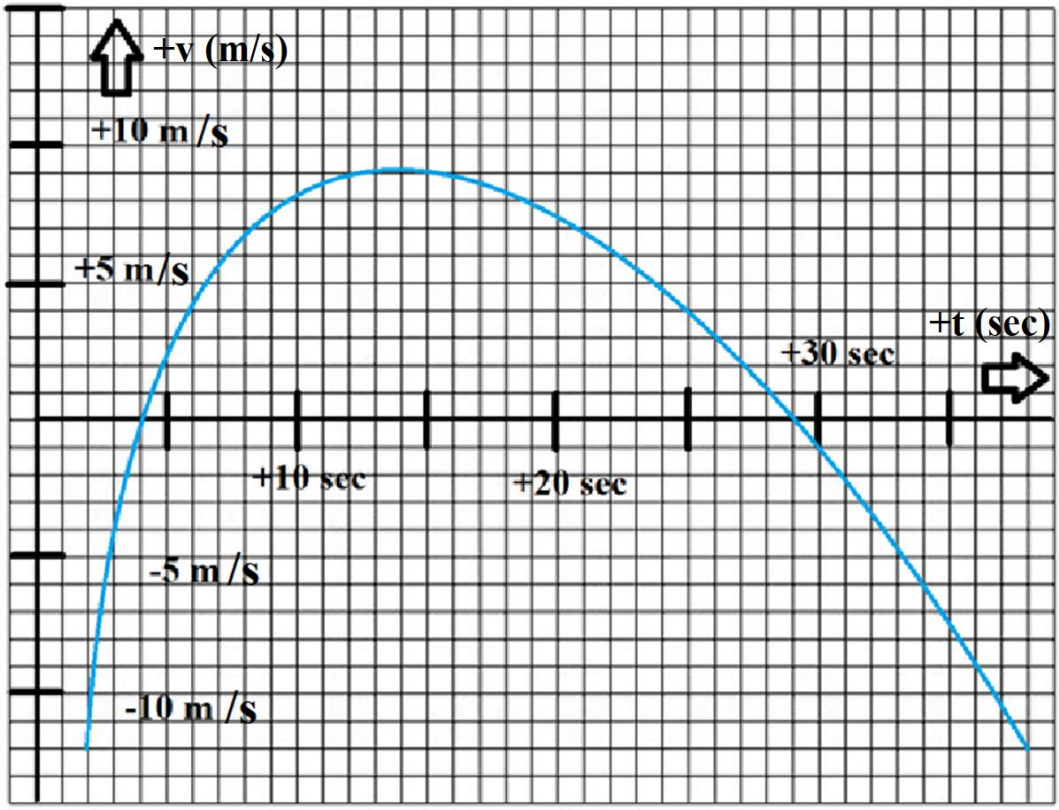
b. Give all your solutions to two significant figures. Determine the *velocity* and *acceleration* of the object at

Time (s)	Velocity (m/s)	Acceleration (m/s^2)
12		
23		
29		

c. Determine the *total distance* the object travels from $t = 2$ s to $t = 33$ s.

d. Determine the *displacement* of the object from $t = 2$ s to $t = 33$ s.

6. E: An object can move to the left or right in one dimension. Positive displacement is towards the right and negative displacement is towards the left. Its *velocity vs. time* graph is shown below.



a. Is the object moving to the left or the right? Is its acceleration increasing, decreasing, or constant?

From $t = 2$ s to $t = 4$ s	
From $t = 4$ s to $t = 14$ s	
From $t = 14$ s to $t = 29$ s	
From $t = 29$ s to $t = 38$ s	

b. Determine the *velocity* and *acceleration* of the object during the following times. Give all your solutions to two significant figures.

Time [s]	Velocity [m/s]	Acceleration [m/s^2]
4		
14		
29		

c. Determine the *total distance* the object travels from $t = 2.0$ s to $t = 38$ s.

d. Determine the *displacement* of the object from $t = 2.0$ s to $t = 38$ s.

Take a break and play this video game:
https://universeandmore.com/motion-mapper/