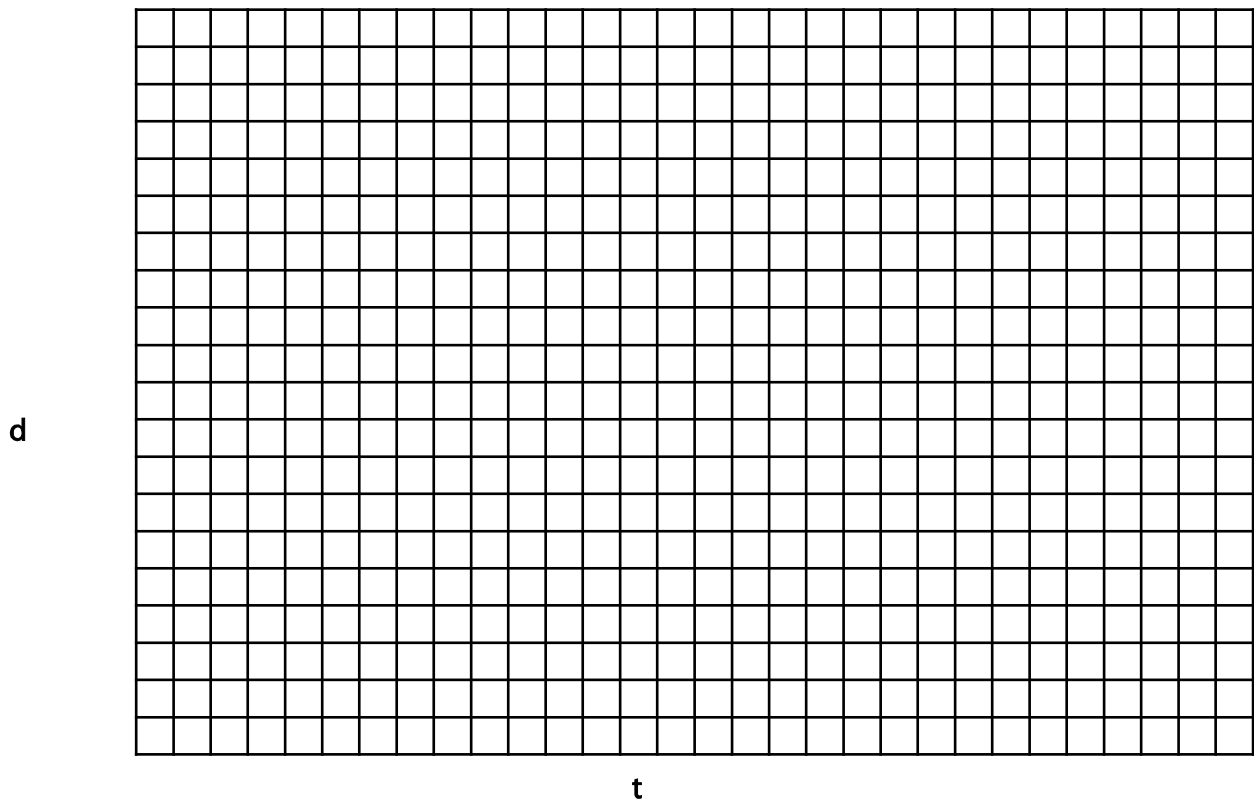


Graphing Motion Kinematics Worksheet

1. A car travels at a constant 20 m/s for 10 s.
 - a. Complete the table showing the car's displacement from the origin at the end of each second. Graph the motion, and place units on the graph.

t (s)	d (m)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

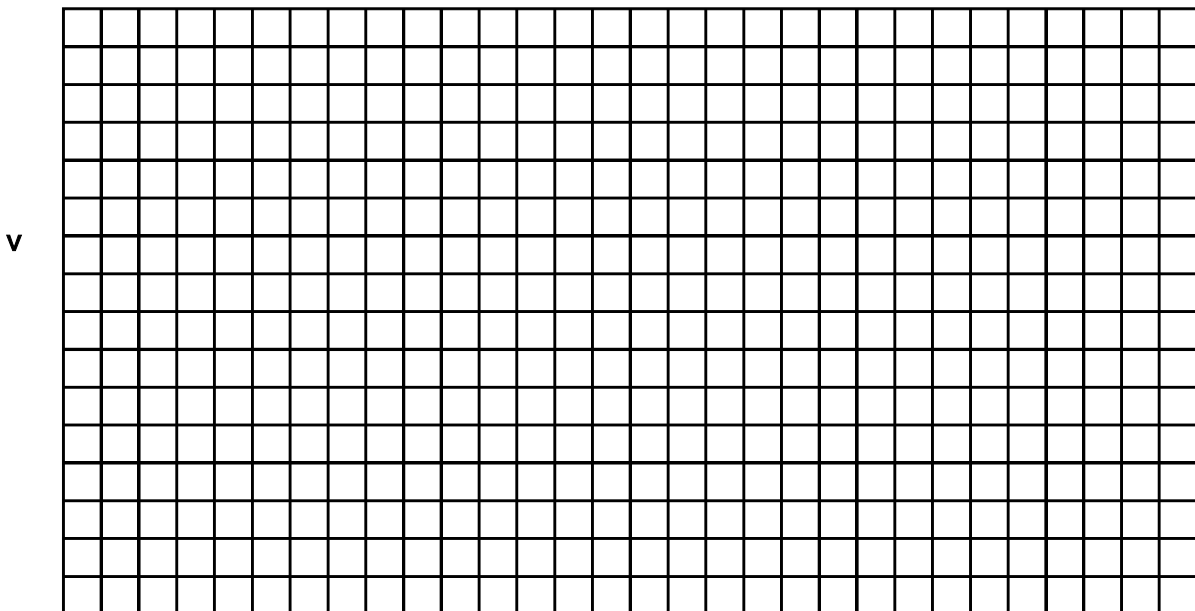


b. What is the slope of the curve plotted, and what are the units?

c. How does this value compare to the velocity stated in the question?

d. Complete the table showing the car's velocity at the end of each second. Graph the velocity vs. time, and include units on your graph.

t (s)	v (m/s)	t (s)	v (m/s)
1		6	
2		7	
3		8	
4		9	
5		10	



e. Find the area under the curve for the first 5 seconds. What are the units?

f. How does this value compare to the displacement for the first 5 seconds, found in (a)?

2. Complete the sentences:

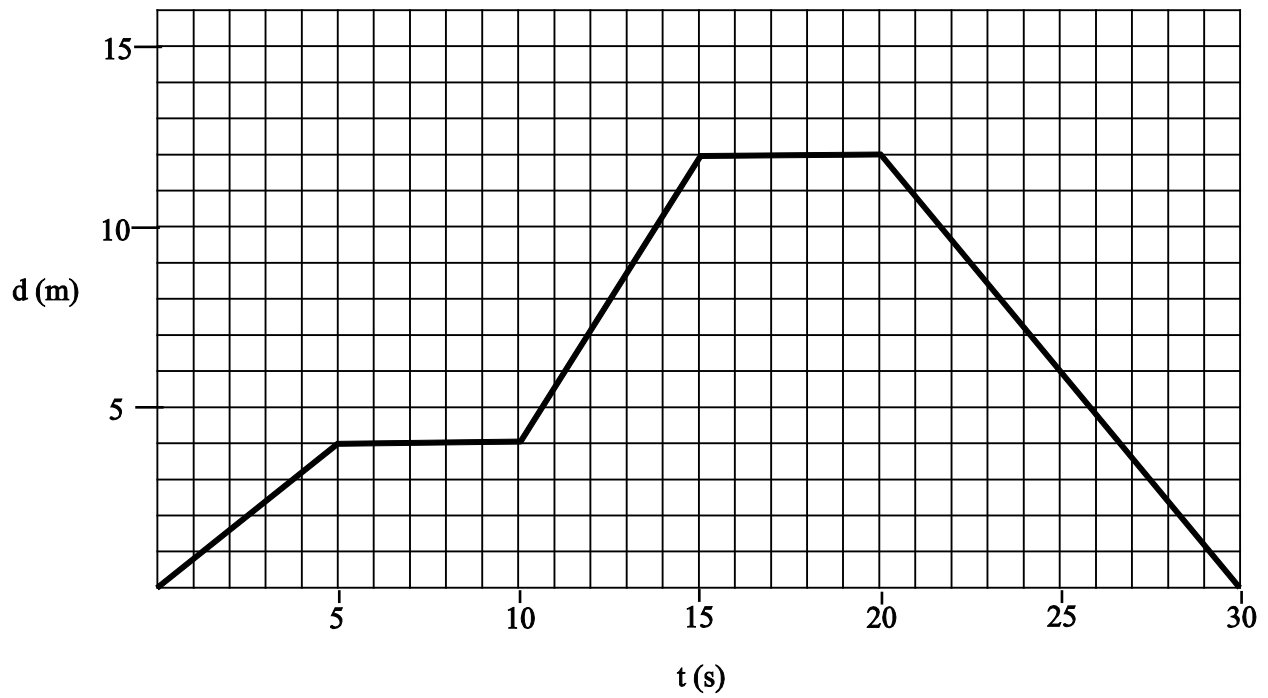
a. The slope of a displacement vs. time graph represents _____ .

b. The slope of a velocity vs. time graph represents _____ .

c. The area under the acceleration vs. time graph represents _____ .

d. The area under the velocity vs. time graph represents _____ .

3. Answer the following questions using the displacement vs. time graph shown.



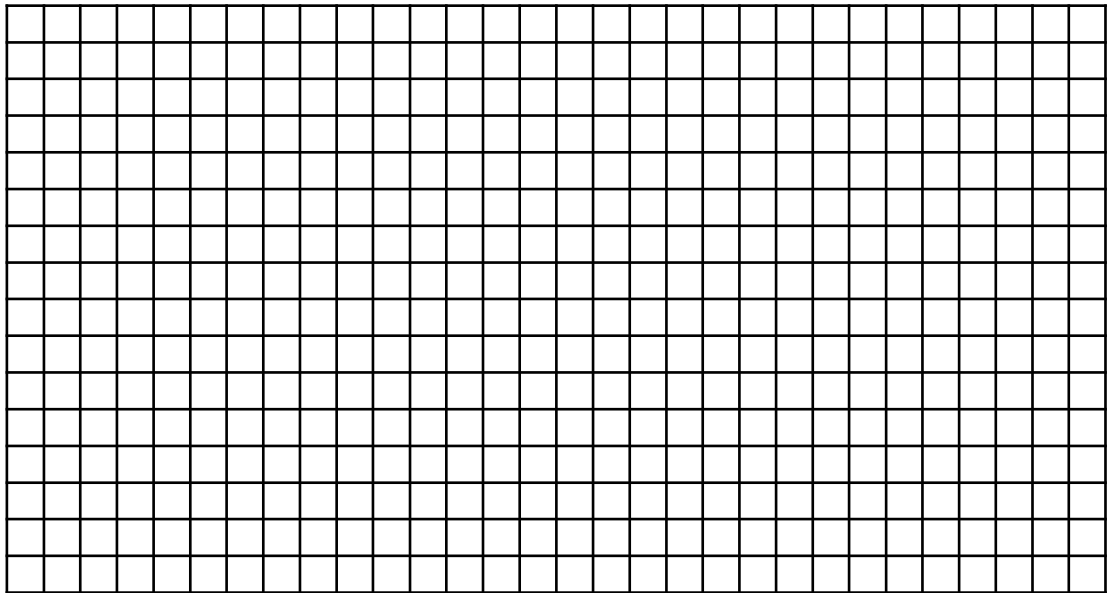
- How far does the object travel during the first five seconds (1 s to 5 s)?
- How far does the object travel during the second five seconds (5 s to 10 s)?
- How far does the object travel during the third five seconds (10 s to 15 s)?
- How far does the object travel during the fourth five seconds (15 s to 20 s)?

e. How far does the object travel during the last ten seconds (20 s to 30 s)?

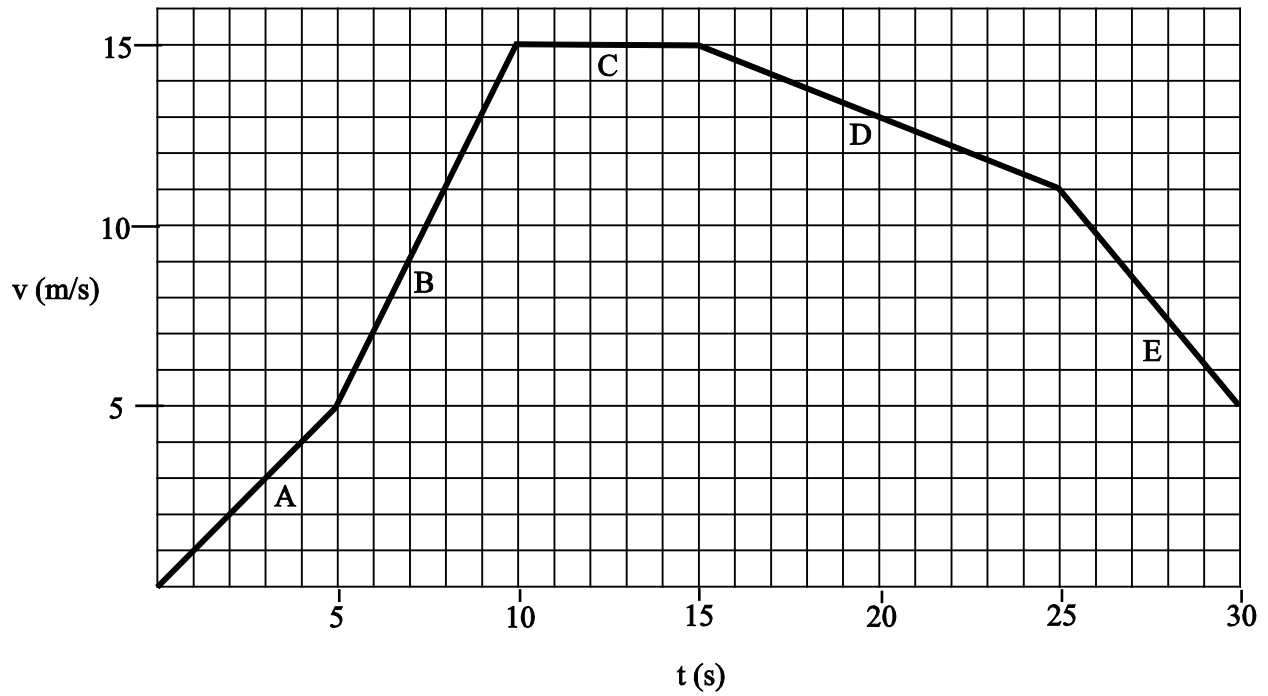
f. During which time interval(s) is the object standing still?

g. Does the object ever accelerate in this scenario?

h. Draw the velocity vs. time graph for this scenario.



4. Answer the following questions using the velocity vs. time graph shown.



- During which interval(s) is the object accelerating?
- During which intervals is the acceleration the greatest?
- During which interval(s) is the object standing still?
- During which interval(s) does the object have a constant speed?

e. What is the displacement during interval **A**?

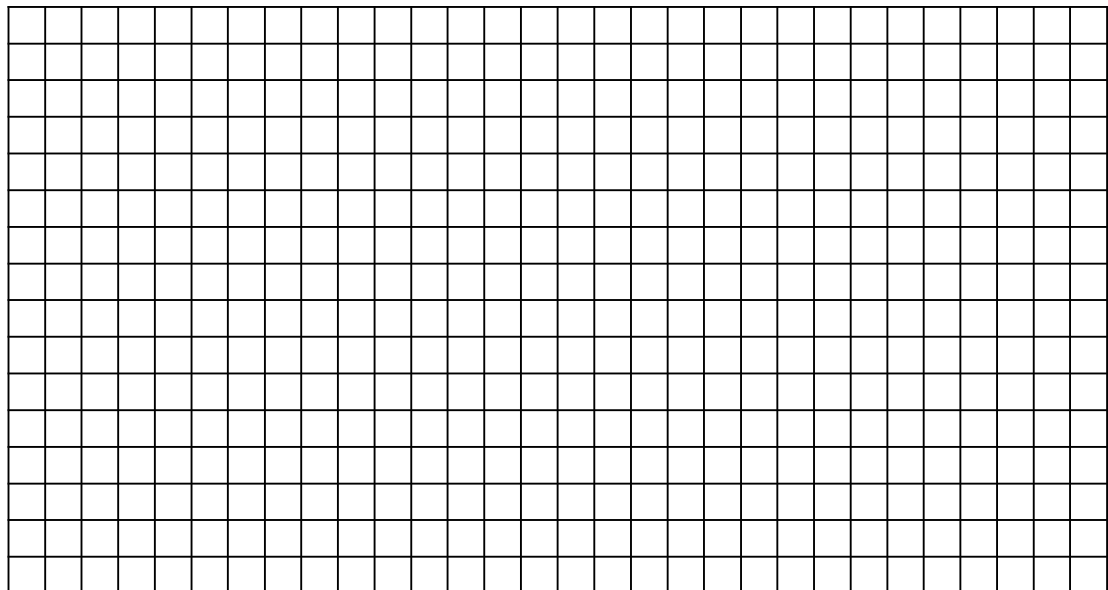
f. What is the displacement during interval **B**?

g. What is the displacement during interval **C**?

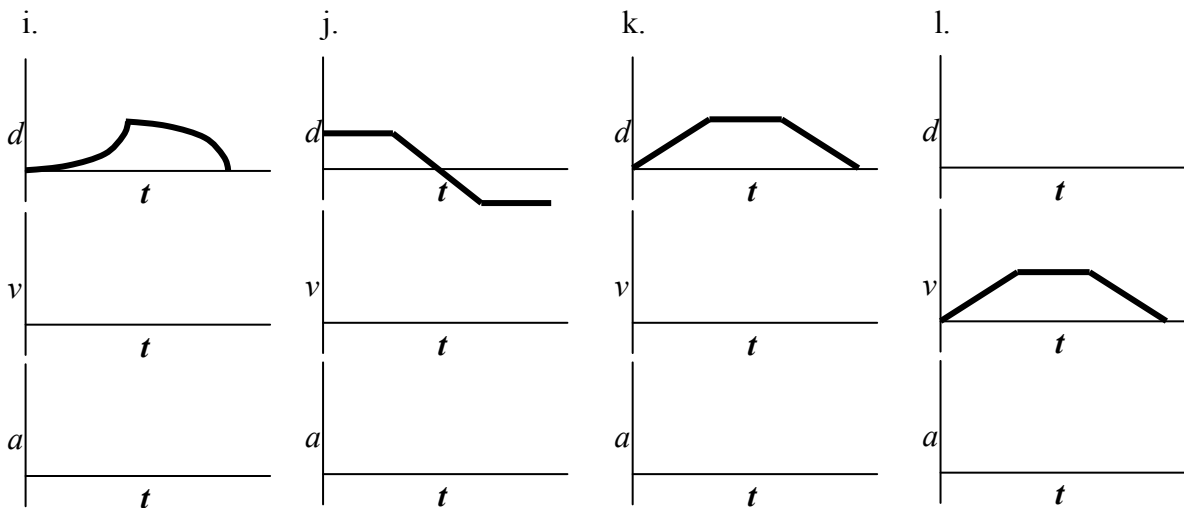
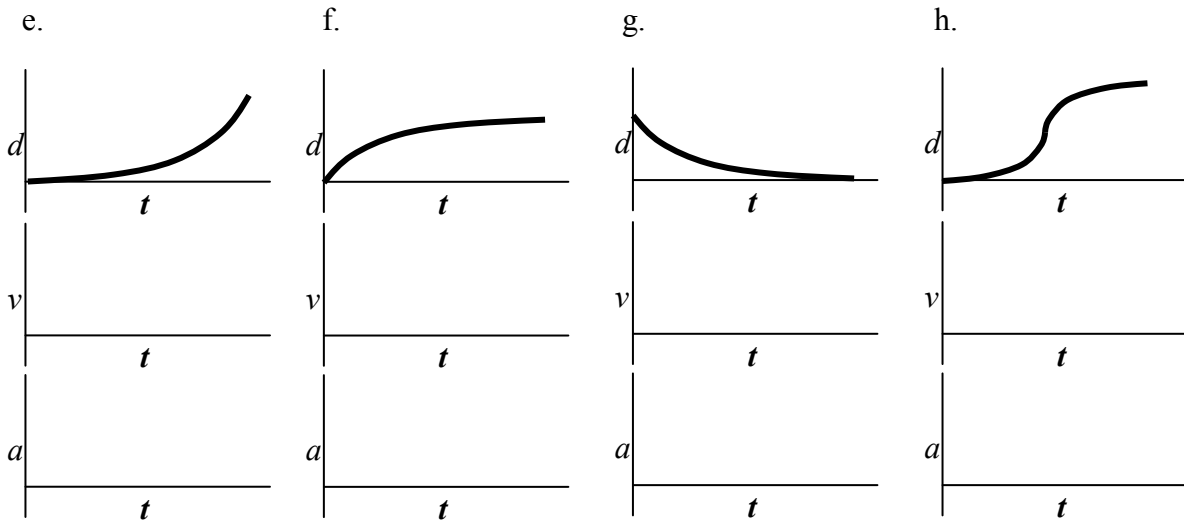
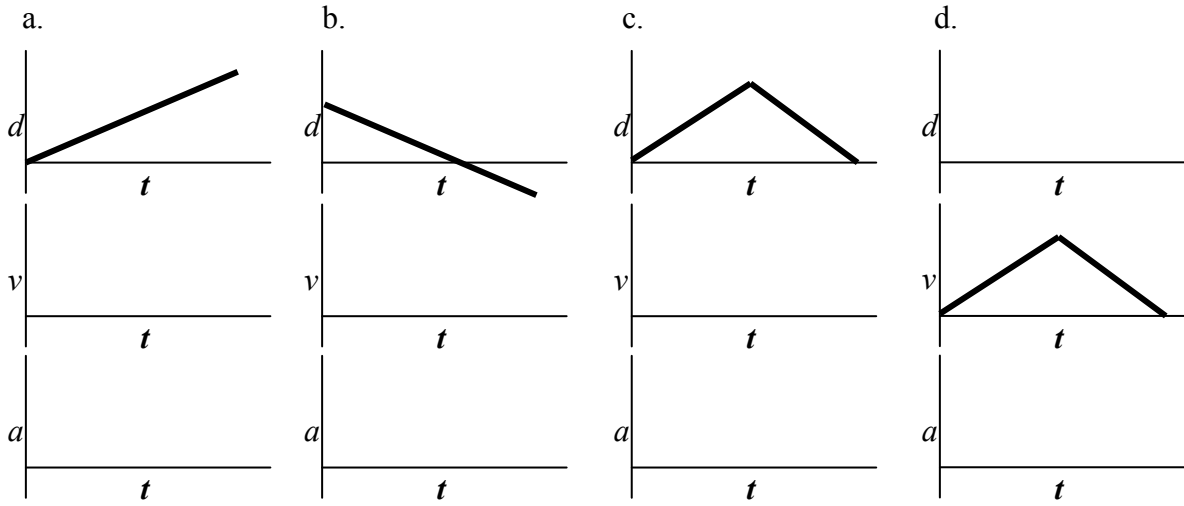
h. What is the displacement during interval **D**?

i. What is the displacement during interval **E**?

j. Draw the acceleration vs. time graph for this scenario.



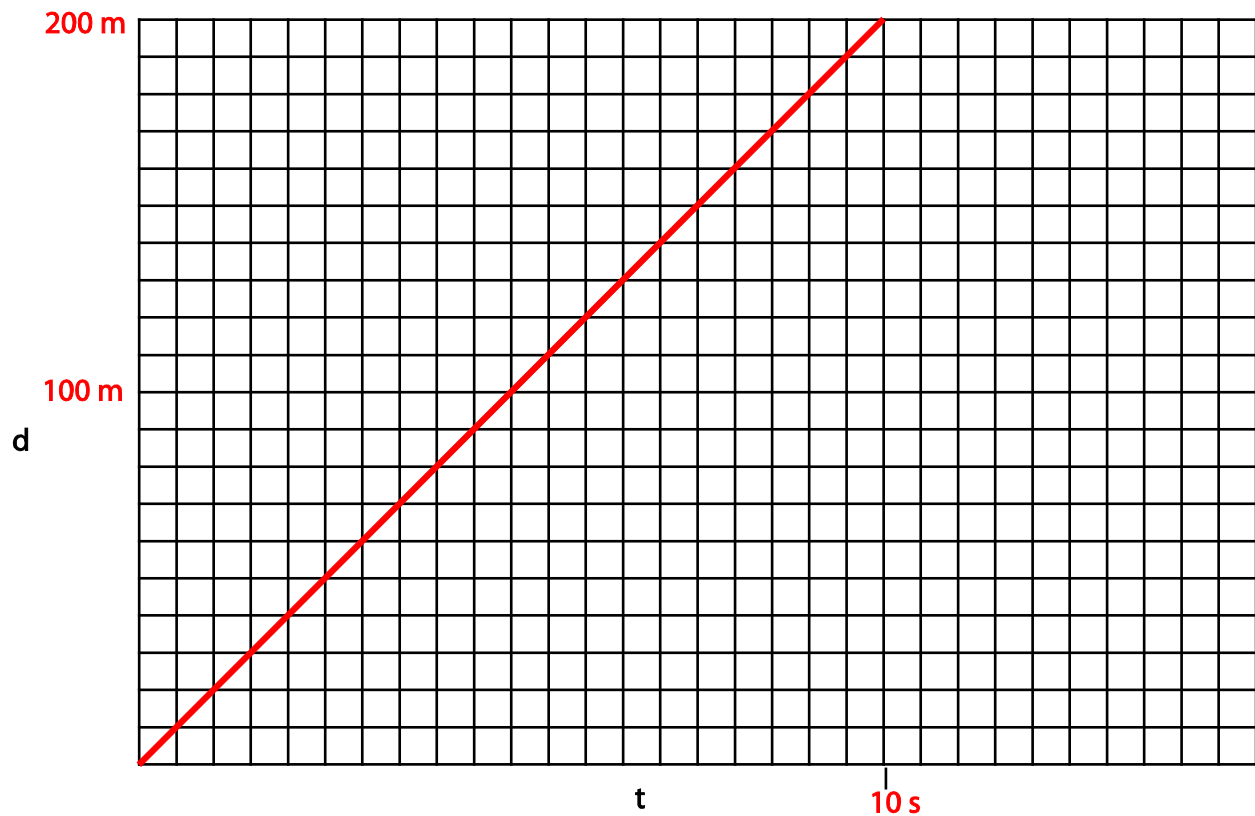
5. Complete the series of graphs shown for displacement vs. time, velocity vs. time, and acceleration vs. time.



Graphing Motion Kinematics Worksheet

1. A car travels at a constant 20 m/s for 10 s.
 - a. Complete the table showing the car's displacement from the origin at the end of each second. Graph the motion, and place units on the graph.

t (s)	d (m)
1	20
2	40
3	60
4	80
5	100
6	120
7	140
8	160
9	180
10	200



b. What is the slope of the curve plotted, and what are the units?

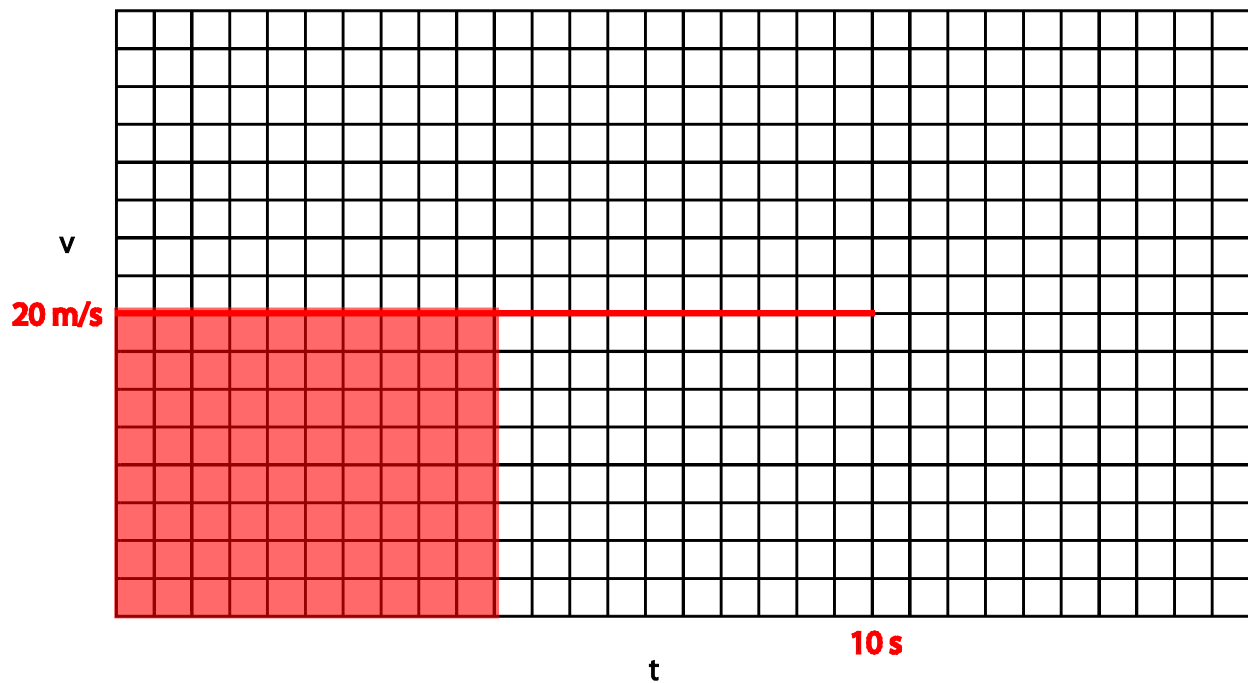
- 20 m/s

c. How does this value compare to the velocity stated in the question?

- It is the same.

d. Complete the table showing the car's velocity at the end of each second. Graph the velocity vs. time, and include units on your graph.

t (s)	v (m/s)	t (s)	v (m/s)
1	20	6	20
2	20	7	20
3	20	8	20
4	20	9	20
5	20	10	20



e. Find the area under the curve for the first 5 seconds. What are the units?

- 100 m

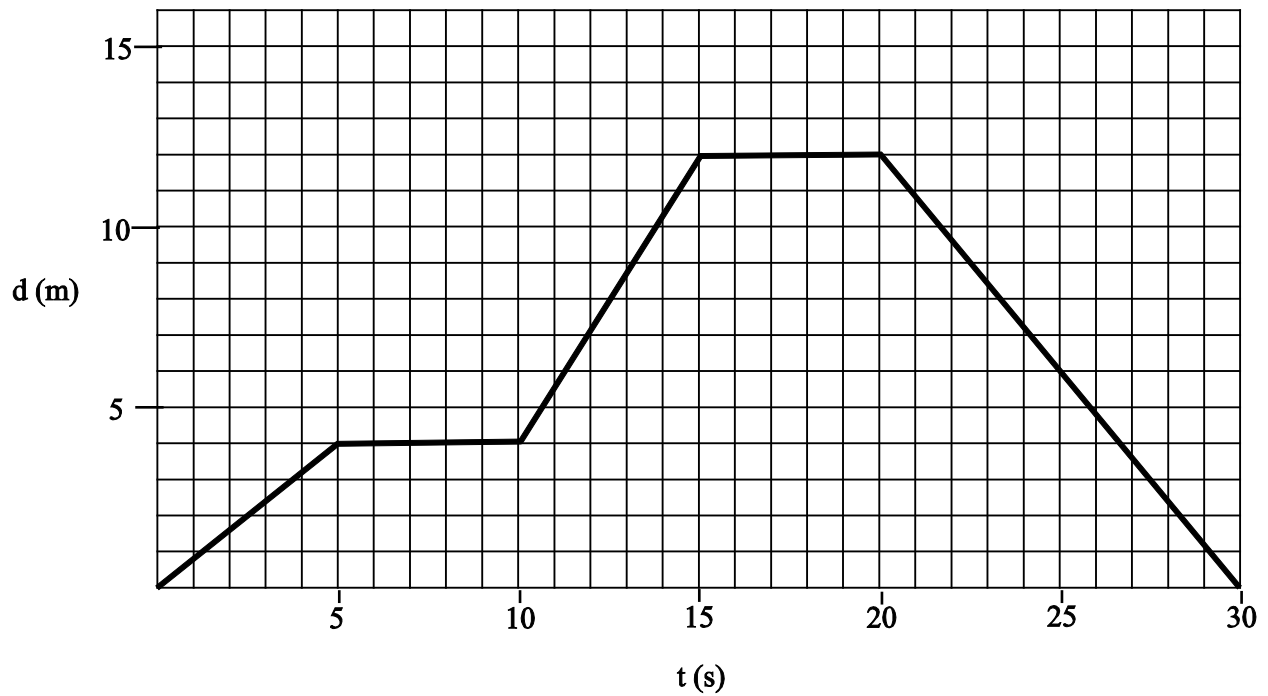
f. How does this value compare to the displacement for the first 5 seconds, found in (a)?

- It is the same.

2. Complete the sentences:

- The slope of a displacement vs. time graph represents velocity.
- The slope of a velocity vs. time graph represents acceleration.
- The area under the acceleration vs. time graph represents velocity.
- The area under the velocity vs. time graph represents displacement.

3. Answer the following questions using the displacement vs. time graph shown.



a. How far does the object travel during the first five seconds (1 s to 5 s)?

- 4 m

b. How far does the object travel during the second five seconds (5 s to 10 s)?

- 0 m

c. How far does the object travel during the third five seconds (10 s to 15 s)?

- 8 m

d. How far does the object travel during the fourth five seconds (15 s to 20 s)?

- 0 m

e. How far does the object travel during the last ten seconds (20 s to 30 s)?

- -12 m

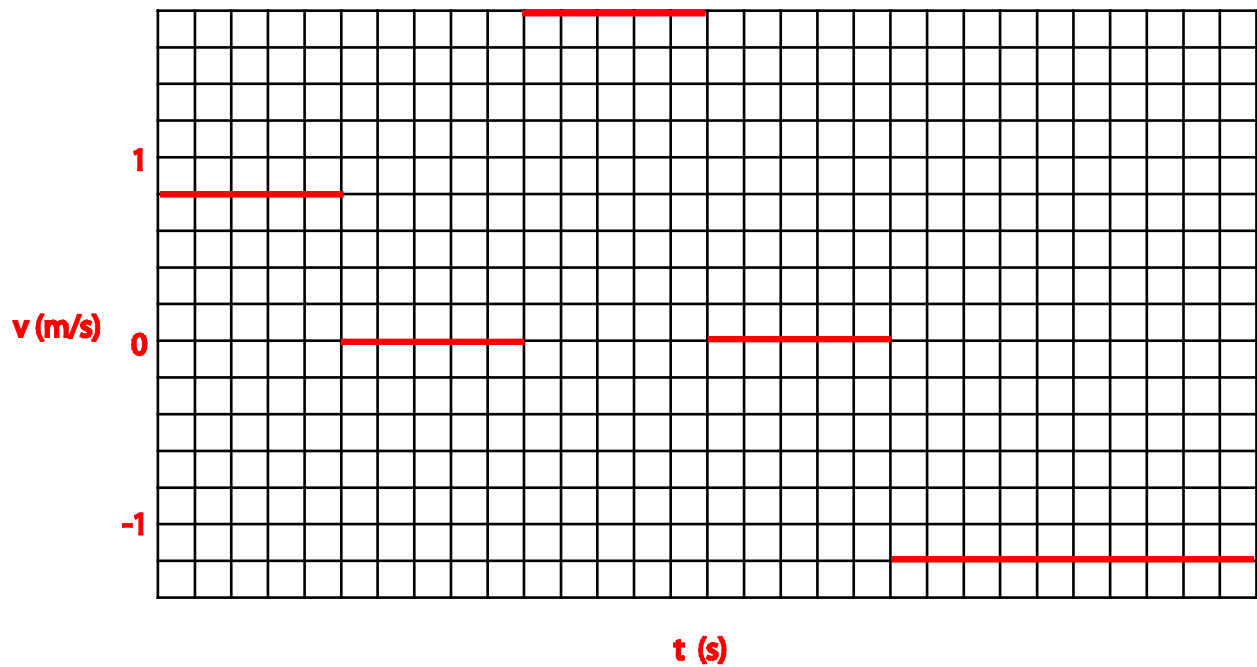
f. During which time interval(s) is the object standing still?

- 5–10 s, and 15–20 s

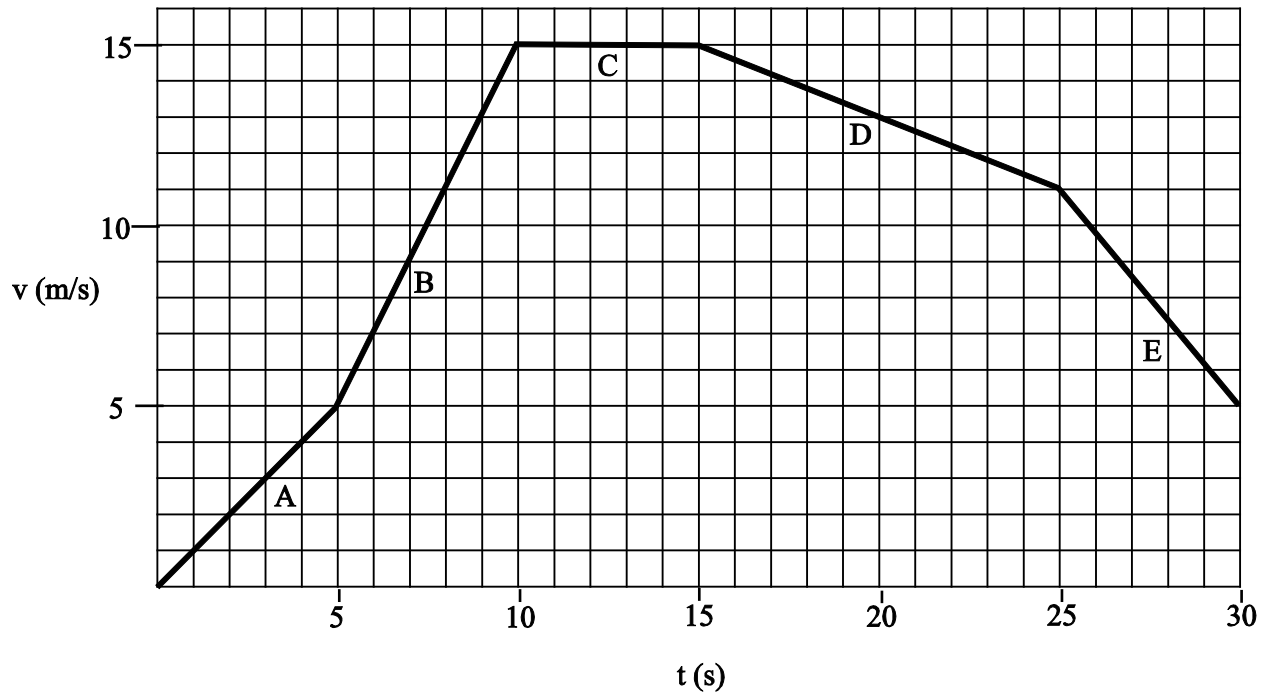
g. Does the object ever accelerate in this scenario?

- No, all changes in velocity appear instantaneous.

h. Draw the velocity vs. time graph for this scenario.



4. Answer the following questions using the velocity vs. time graph shown.



a. During which interval(s) is the object accelerating?

- A, B, D, E

b. During which intervals is the acceleration the greatest?

- B

c. During which interval(s) is the object standing still?

- None

d. During which interval(s) does the object have a constant speed?

- C

e. What is the displacement during interval **A**?

- 12.5 m

f. What is the displacement during interval **B**?

- 50 m

g. What is the displacement during interval **C**?

- 75 m

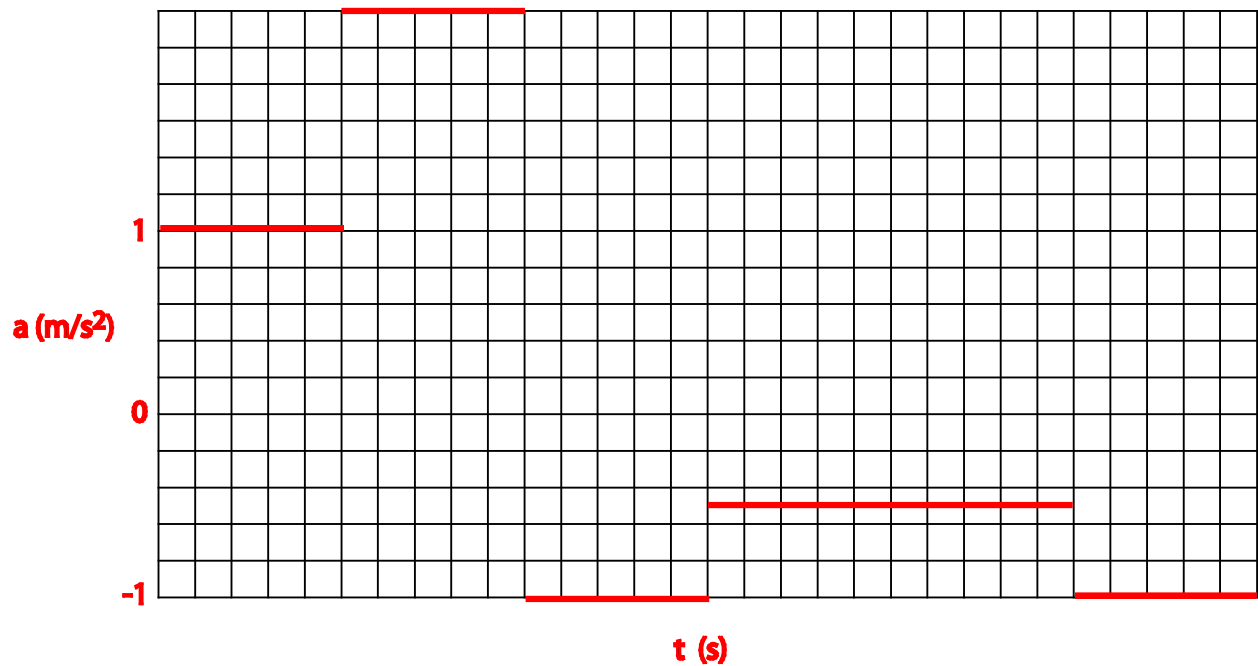
h. What is the displacement during interval **D**?

- 125 m

i. What is the displacement during interval **E**?

- 37.5 m

j. Draw the acceleration vs. time graph for this scenario.



5. Complete the series of graphs shown for displacement vs. time, velocity vs. time, and acceleration vs. time.

