

ACCELERATION CALCULATIONS

Name _____

Acceleration means a change in speed or direction. It can also be defined as a change in velocity per unit of time.

$$a = \frac{v_f - v_i}{t}$$

where a = velocity
v_f = final velocity
v_i = initial velocity
t = time

Calculate the acceleration for the following data.

	<u>Initial Velocity</u>	<u>Final Velocity</u>	<u>Time</u>	<u>Acceleration</u>
1.	0 km/hr	24 km/hr	3 s	_____
2.	0 m/s	35 m/s	5 s	_____
3.	20 km/hr	60 km/hr	10 s	_____
4.	50 m/s	150 m/s	5 s	_____
5.	25 km/hr	1200 km/hr	2 min	_____

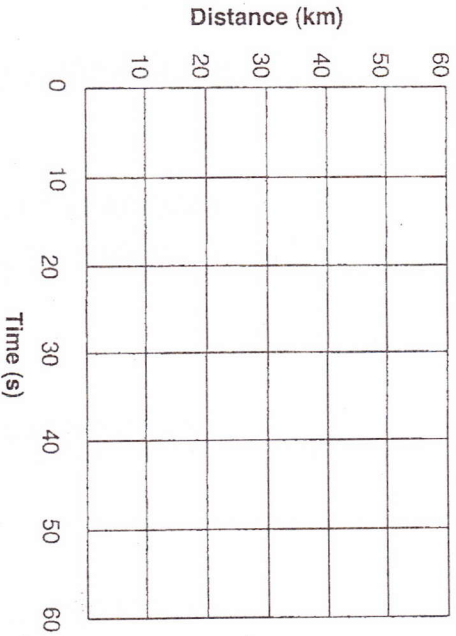
- A car accelerates from a standstill to 60 km/hr in 10.0 seconds.
What is its acceleration? _____
- A car accelerates from 25 km/hr to 55 km/hr in 30 seconds.
What is its acceleration? _____
- A train is accelerating at a rate of 2.0 km/hr/s.
If its initial velocity is 20 km/hr, what is its velocity after 30 seconds? _____
- A runner achieves a velocity of 11.1 m/s 9 s after he begins.
What is his acceleration? _____
What distance did he cover? _____

GRAPHING DISTANCE VS. TIME

Name _____

Plot the following data on the graph and answer the questions below.

Distance (km)	Time (s)
0	0
5	10
12	20
20	30
30	40
42	50
56	60



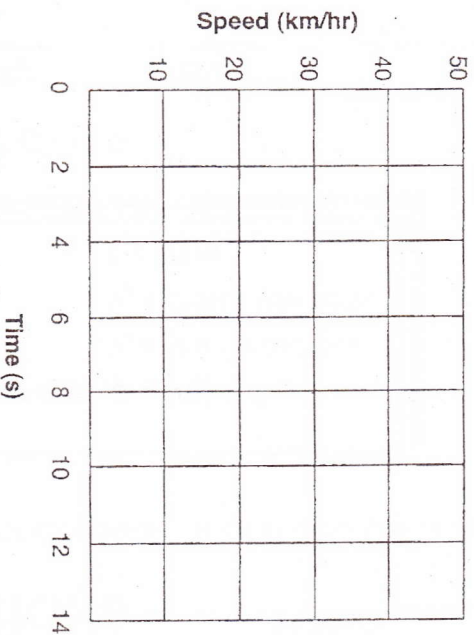
1. What is the average speed at $t = 20$ s? _____
2. What is the average speed at $t = 30$ s? _____
3. What is the acceleration between 20 s and 30 s? _____
4. What is the average speed at $t = 40$ s? _____
5. What is the average speed at $t = 60$ s? _____
6. What is the acceleration between 40 s and 60 s? _____
7. Is the object accelerating at a constant rate? _____

GRAPHING SPEED VS. TIME

Name _____

Plot the following data on the graph and answer the questions below.

Speed (km/hr)	Time (s)
0.0	0
10.0	2
20.0	4
30.0	6
40.0	8
50.0	10



1. As time increases, what happens to the speed? _____
2. What is the speed at 5 s? _____
3. Assuming constant acceleration, what would be the speed at 14 s? _____
4. At what time would the object reach a speed of 45 km/hr? _____
5. What is the object's acceleration? _____
6. What would the shape of the graph be if a speed of 50.0 km/hr is maintained from 10 s to 20 s? _____
7. Based on the information in Problem 6, calculate the acceleration from 10 s to 20 s _____
8. What would the shape of the graph be if the speed of the object decreased from 50.0 km/hr at 20 s to 30 km/hr at 40 s? _____
9. What is the acceleration in Problem 8? _____