

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.

$a = \frac{v_f - v_i}{t}$ <p style="text-align: center; margin: 0;">↑</p>	<p>where a = acceleration</p> <p>v_f = final velocity</p> <p>v_i = initial velocity</p> <p>t = time</p>
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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	

6. A car accelerates from a standstill to 60 km/hr in 10.0 seconds.
What is its acceleration?

7. A car accelerates from 25 km/hr to 55 km/hr in 30 seconds.
What is its acceleration?

8. 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?

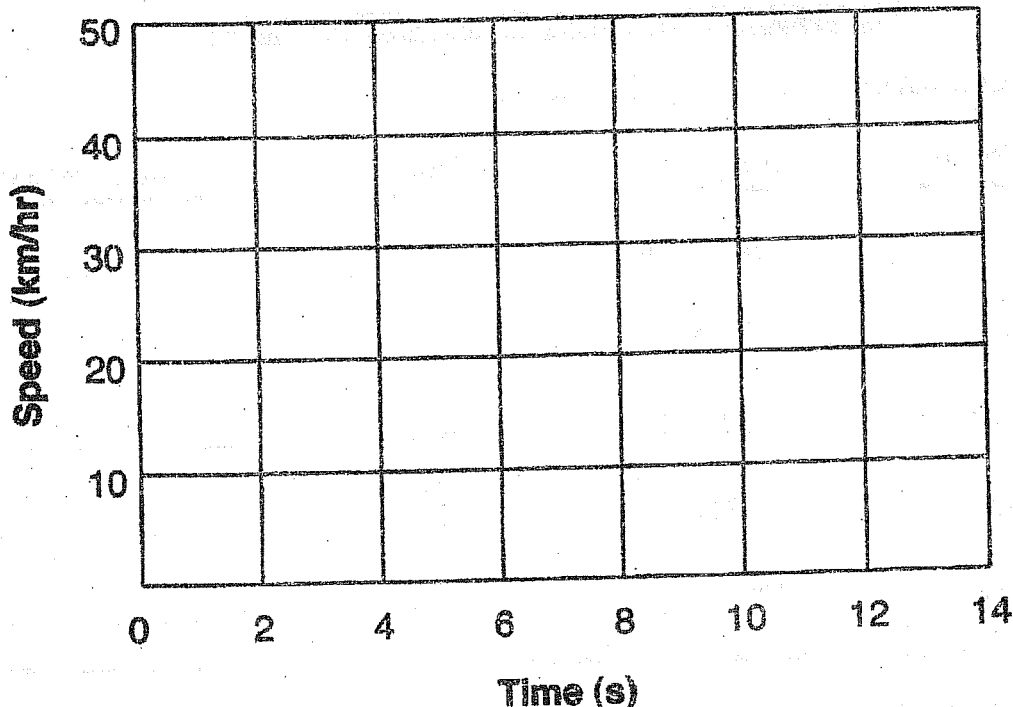
9. A runner achieves a velocity of 11.1 m/s 9 s after he begins.
What is his acceleration?
What distance did he cover?

GRAPHING SPEED VS. TIME

Name _____

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

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



- As time increases, what happens to the speed? _____
- What is the speed at 5 s? _____
- Assuming constant acceleration, what would be the speed at 14 s?

- At what time would the object reach a speed of 45 km/hr? _____
- What is the object's acceleration? _____
- What would the shape of the graph be if a speed of 50.0 km/hr is maintained from 10 s to 20 s? _____
- Based on the information in Problem 6, calculate the acceleration from 10 s to 20 s.

- 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? _____
- What is the acceleration in Problem 8? _____