ACCELERATION PRACTICE PROBLEMS

$$\textit{Acceleration} = \frac{\textit{Final Velocity} - \textit{Initial Velocity}}{\textit{time}}$$

YOU MUST SHOW YOUR WORK.
You can use a calculator but you must show all of the steps involved in doing the problem.

SHORT ANSWER

1. Does the speedometer of a car read average speed or instantaneous speed? How do you know?

2. If the speedometer of your car reads a constant speed of 40km/hr, can you say 100% for sure that the car has a constant velocity? Explain your answer.

3. What is the acceleration of a car that travels in a straight line at a constant speed?

4. Describe a situation in which you can accelerate even though your speed doesn't change.

CALCULATIONS: Using the given information, **calculate for the unknown variable**. **SHOW YOUR WORK**! ***READ CAREFULLY!***

5. v_i: 0 km/hr v_f: 24 km/hr t = 3 a = ?

- **A:** 4 km/hr/s
- **B:** 8 km/hr/s
- **C:** 12 km/hr/s

6. v_i: 0 m/s v_f: 35 m/s t = 5s. a = ?

- **A:** 7 m/s/s
- **B:** 5 m/s/s
- **C:** 105 m/s/s

7. **A car accelerates from a standstill to 60 km/hr in 10 seconds. What is its acceleration?**

- **A:** 6 km/hr/s
- **B:** 9 km/hr/s
- **C:** 15 km/hr/s

8. A train is accelerating at a rate of 2.0 km/hr/s. If the initial velocity is 20 km /hr, what is the velocity after 30s?

- **A:** 40 km/hr
- **B:** 80 km/hr
- **C:** 120 km/hr

9. A roller coaster car rapidly picks up speed as it rolls down a slope. As it starts down the slope, its speed is 4 m/s. But 3 seconds later, at the bottom of the slope, its speed is 22 m/s. What is its average acceleration?

10. A cyclist accelerates from 0 m/s to 8 m/s in 3 seconds. What is his acceleration? Is this acceleration higher than that of a car which accelerates from 0 to 30 m/s in 8 seconds?

11. You are traveling in a car that is moving at a velocity of 20 m/s. Suddenly, a car 10 meters in front of you slams on it's brakes. At that moment, you also slam on your brakes and slow to 5 m/s. Calculate the acceleration if it took 2 seconds to slow your car down.

12. A ball is dropped from the top of a building. After 2 seconds, its velocity is measured to be 19.6 m/s. Calculate the acceleration for the dropped ball.

13. If a Ferrari, with an initial velocity of 10 m/s, accelerates at a rate of 50 m/s/s for 3 seconds, what will its final velocity be?