

Formula: $v = \frac{\Delta d}{\Delta t}$ or $\frac{d_f - d_i}{\Delta t}$ $\Delta d = \left(\frac{\vec{v}_f + \vec{v}_i}{2}\right)\Delta t$ $\vec{v}_f = \vec{v}_i + \vec{a}_{av}\Delta t$ $\Delta \vec{d} = \vec{v}_i\Delta t + \frac{1}{2}\vec{a}_{av}\Delta t^2$

$v_f^2 = v_i^2 + 2a_{av}\Delta d$ $\Delta \vec{d} = \vec{v}_f\Delta t - \frac{1}{2}\vec{a}_{av}\Delta t^2$ $a^2 + b^2 = c^2$ $v = \frac{d}{t}$

Multiple Choice Questions – Circle the letter answer and record your final decisions in the **answer table** at the end of the section. (10 marks)

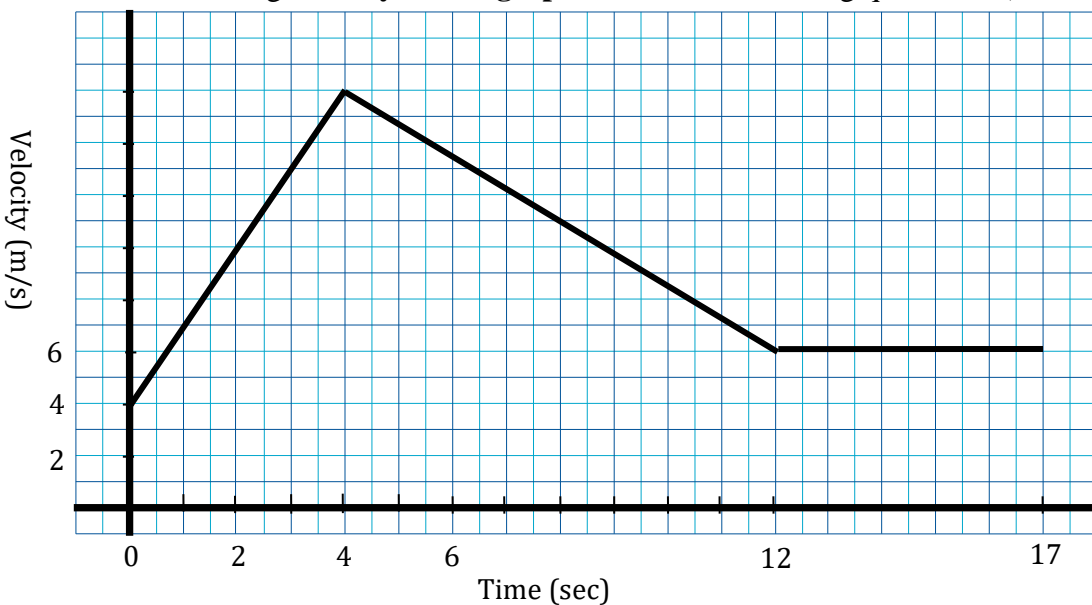
<p>1. A car starts from rest and speeds up to 10.0 m/s in 4.0 s. What is the acceleration of the car?</p> <p>(a) 40 m/s² (b) 25 m/s² (c) 2.5 m/s² (d) 2.0 m/s²</p>	<p>2. If you walk 450 m north and then 200 m south, what is your distance travelled?</p> <p>(a) 250 m (b) 250 m north (c) 650 m (d) 650 m north</p>
<p>3. 50 km/hr express in m/s is best represented by:</p> <p>(a) 180 m/s (b) 13.9 m/s (c) 180 m/s (d) 0.0000139 m/s</p>	<p>4. Acceleration on Earth is best represented by:</p> <p>(a) 9.8 m/s² (b) -9.8 m/s² (c) 9.8 m/s (d) -9.8 m</p>
<p>5. A girl drops a penny off a bridge. The penny lands in the water after 1.2 s. What is the speed of the penny just before it hits the water?</p> <p>(a) 10 m/s (b) 12 m/s (c) 13 m/s (d) 14 m/s</p>	<p>6. Which of the following describes a displacement quantity?</p> <p>(a) 60 km. (b) 50 km/hr (c) 24 km [E] (d) 9.81m/s.</p>

Multiple Choice Answers:

1. 2. 3. 4. 5. 6.

Short Answer: Be sure to include the appropriate **UNITS** and show your thinking.

7. For the following **velocity – time graph** answer the following questions. (9 marks)



- (i) What is the **velocity** at t = 3 sec, t = 8 sec and t = 14 sec?
- (ii) What is the **displacement** after t = 4 sec and t = 17 sec?
- (iii) What is the **acceleration** at t = 3 sec, t = 8 sec and t = 15 sec?

8. A van merges onto a highway on-ramp with a velocity of 84 km/h and accelerates at a rate of 2.5 m/s^2 for 3.0 s. (4 marks)

(a) What is the displacement of the van over this time?

(b) What is the final velocity of the van?

9. A flower pot falls from its windowsill it was placed on down 16m to the sidewalk below.

(i) How long does it take to fall to the sidewalk? (4 marks)

(ii) How fast is the flower pot traveling right before it strikes the sidewalk?

10. A race is going to take place over a 100m long straight track.

Contestant One is an elite human athlete, who starts from rest and uniformly accelerates at 2.8 m/s^2 for 4 seconds and then continues at a uniform velocity till the end of the race.

Contestant Two is a high school teenager on an old bicycle. The teenager on the bicycle gets a moving start and is known to peddle at a constant 9.1 m/s.

Who will win the race? Justify your answer, **keep two decimal places of accuracy**. (6 marks)