

Unit P1 Review (Motion) - Part II

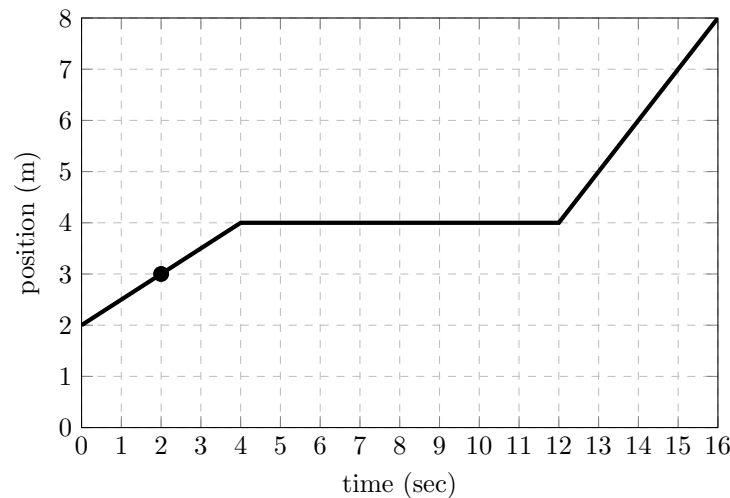
1. What are the three ways to accelerate?

Solution: speed up, slow down, change direction

2. What is the acceleration of a car moving at a constant speed in a straight line? How do you know?

Solution: zero. The velocity is not changing.

3. The motion of an object during a 16 second time period is graphed below.



- (a) What is the object's position at 2 seconds?

Solution: 3 meters

- (b) How far has the object traveled from the beginning of the motion ($t = 0$ s) to the point indicated by the dot on the graph ($t = 2$ s)?

Solution: 1 meter

- (c) What is the object doing at 2 seconds? (for example, moving forward and speeding up, moving backward at a constant speed, standing still, etc.)

Solution: moving forward at a constant speed

- (d) What distance did the object between when it started ($t = 0$ s) and ended ($t = 16$ s) its motion.

Solution: 6 meters

- (e) What is the velocity of the object between 0 seconds and 4 seconds?

Solution: 0.5 m/s

- (f) What is the velocity of the object between 12 seconds and 16 seconds?

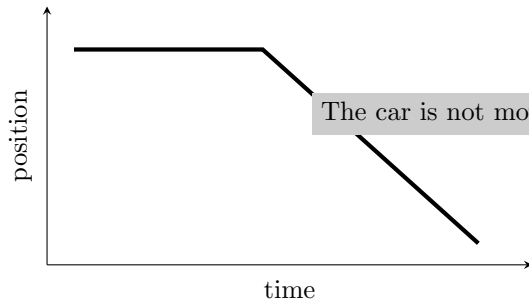
Solution: 1 m/s

Name: _____

Date: _____

Period: _____

4. A position versus time graph of a car is shown below. Explain in at least two sentences what the car is doing.



The car is not moving and then moves backwards at a constant speed

5. How far will a train moving at 15.7 m/s go in 50 seconds?

Solution:

$$v = 15.7 \text{ m/s}$$

$$t = 50 \text{ s}$$

$$v = \frac{d}{t}$$

$$15.7 = \frac{d}{50}$$

$$d = 785 \text{ s}$$

6. A bird flies at a speed of 5.56 m/s. How much time does it take for the bird to fly 6000 m?

Solution:

$$v = 5.56 \text{ m/s}$$

$$d = 6000 \text{ m}$$

$$v = \frac{d}{t}$$

$$5.56 = \frac{6000}{t}$$

$$t = 1079 \text{ s}$$

7. A rocket accelerates from rest to 400 m/s in 75 seconds. What is its acceleration?

Solution:

$$v_i = 0 \text{ m/s}$$

$$t = 75 \text{ s}$$

$$v_f = 400 \text{ m/s}$$

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

$$a = \frac{(400 - 0)}{75}$$

$$a = 5.33 \text{ m/s}^2$$

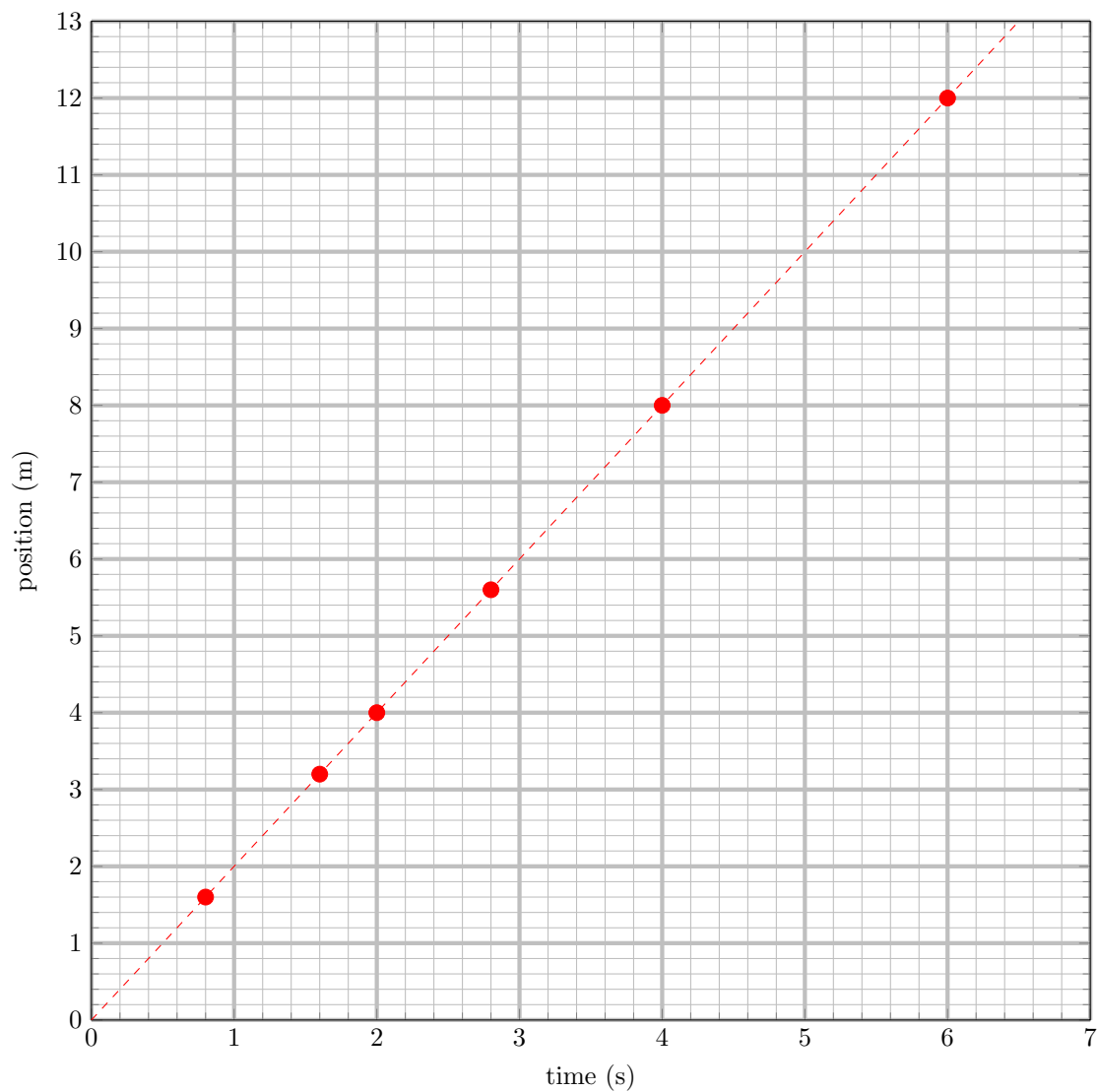
Name: _____

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8. Given the following data, make a graph of position vs. time of the motion of this object. Fit a straight line to the data graphed.

Time (s)	Postion (m)
0.8	1.6
1.6	3.2
2.0	4.0
2.8	5.6
4.0	8.0
6.0	12.0



9. Use the graph to determine the velocity of the car.

Solution:

$$\begin{aligned}\frac{\text{rise}}{\text{run}} &= \frac{8 \text{ m}}{4 \text{ s}} \\ &= 2 \text{ m/s}\end{aligned}$$

Name:

Date:

Period:
