

Name \_\_\_\_\_

## Kinematics WS 1

$$v = d/t \text{ or } d = vt \text{ or } t = d/v$$

1. In a drill during basketball practice, a player runs the length of the 30.-meter court and back. The player does this three times in 60 seconds. What is the average speed of the player during the drill?
2. On a highway, a car is driven 80 kilometers during the first 1.00 hour of travel, 50 kilometers during the next 0.50 hour, and 40 kilometers in the final 0.50 hour. What is the car's average speed for the entire trip?
3. A high-speed train in Japan travels a distance of 300 kilometers in  $3.60 \times 10^3$  seconds. What is the average speed of this train in m/s?
4. A group of bike riders took a 4.0-hour trip. During the first 3.0 hours, they traveled a total of 50 kilometers, but during the last hour they traveled only 10 kilometers. What was the group's average speed for the entire trip?
5. How long will it take an object to move 100 meters if the object is traveling with an average speed of 0.5 meter per second?
6. Two cars, A and B, are 400 meters apart. Car A travels due east at 30 m/s on a collision course with car B, which travels due west at 20 meters per second. How much time elapses before the two cars collide?

$$a = (v_f - v_i) / t$$

7. An object accelerates uniformly from 3.0 m/s east to 8.0 m/s east in 2.0 seconds. What is the magnitude of the acceleration of the object?
8. A car increases its speed from 9.6 m/s to 11.2 m/s in 4.0 seconds. What is the average acceleration of the car during this 4.0-second interval?
9. The speed of a wagon increases from 2.5 m/s to 9.0 m/s in 3.0 seconds as it accelerates uniformly down a hill. What is the magnitude of the acceleration of the wagon during this 3.0-second interval?
10. A child riding a bicycle at 15 m/s accelerates at  $-3.0 \text{ m/s}^2$  for 4.0 seconds. What is the child's speed at the end of this 4.0-second interval?
11. My 1996 Camry accelerates from 0 to 30 m/s in 8.3 s. What is its acceleration? If it can brake to a stop in 5.7 s, what is its acceleration?

$$\mathbf{v_f^2 = v_i^2 + 2a(x_f - x_i)}$$

12. What is the magnitude of the car's acceleration if a car accelerates uniformly from rest to 15 m/s over a distance of 100 meters?
13. A race car starting from rest accelerates uniformly at a rate of 4.90 m/s<sup>2</sup>. What is the car's speed after it has traveled 200 meters?
14. A skater increases her speed uniformly from 2.0 m/s to 7.0 m/s over a distance of 12 meters. What is the magnitude of her acceleration?
15. A car initially traveling at a speed of 16 m/s accelerates uniformly to a speed of 20 m/s over a distance of 36 meters. What is the magnitude of the car's acceleration?
16. An object with an initial speed of 4.0 m/s accelerates uniformly at 2.0 m/s<sup>2</sup> in the direction of its motion for a distance of 5.0 meters. What is the final speed of the object?