Speed, Velocity, and Acceleration Test Extra Practice

1. Make test corrections to your test. In complete sentences, state what the correct answer is and why it is correct.

2. If you have forgotten any units please write a paragraph explaining the importance of units.

   For the following questions, please write your answers on a separate sheet of paper. Please do not forget to SHOW YOUR WORK and INCLUDE UNITS.

3. a. What is the difference between speed and velocity? Provide two examples.
   b. What is the difference between displacement and distance? Provide two examples.

4. A helicopter’s speed increases from 25 m/s to 60 m/s in 5 seconds. What is the acceleration of this helicopter?

5. You are riding the TGV, Europe’s fastest train, which is traveling at a velocity of 540 km/h North. You just realize that you left your favorite book at the back of the train with your luggage. You walk towards the back at a speed of 3 km/h South. What is your resultant velocity?

6. As she rides up a hill, a cyclist slows down from 40 km/h to 6 m/h in 10 seconds. What is her deceleration?

7. A skateboarder traveling at 7 meters per second rolls to a stop at the top of a ramp in 3 seconds. What is the skateboarder’s acceleration?

8. A runner makes one lap around a 200 m track in a time of 25 s. What was the runner’s average speed?

9. A bullet is shot from a rifle with a speed of 720 m/s. How long does it take for the bullet to strike a target 3240 m away?

10. Please write a story describing the following graphs. Don’t forget to include proper terminology in your descriptions: e.g. constant velocity, acceleration, deceleration (negative acceleration) etc.
11. Look at the graph above. It shows how three runners ran a 100-meter race.

14. Which runner won the race? Explain your answer.
15. Which runner stopped for a rest? Explain your answer.
16. How long was the stop? Explain your answer.
17. How long did Bob take to complete the race? Explain your answer.
18. Calculate Albert’s average speed. (Find the distance and the time first!)
Voluntary retake additional questions:

19. Light from the sun reaches the earth in 8.3 minutes. The speed of light is $3.0 \times 10^8$ m/s. In kilometers, how far is the earth from the sun?

20. The peregrine falcon is the world’s fastest known bird and has been clocked diving downward toward its prey at constant vertical velocity of 97.2 m/s. If the falcon dives straight down from a height of 100 m, how much time does this give a rabbit below to escape?

21. Hans stands at the rim of the Grand Canyon and yodels down to the bottom. He hears his yodel back from the canyon floor 5.2 s later. Assume that the speed of sound in air is 340 m/s. How deep is the canyon?

22. The tortoise and the hare are in a road race to defend the honor of their breed. The tortoise crawls the entire 1000 m distance at a speed of 0.2 m/s while the rabbit runs the first 200 m at 2 m/s. The rabbit then stops to take a nap for 1.3 h and awakens to finish the last 800 m with an average speed of 3 m/s. Who wins the race and by how much time?