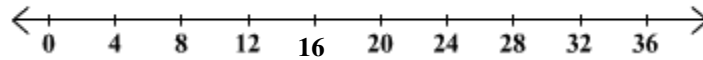


## Review Problems: Unit 2

1. Given below is the motion diagram of a small ball rolling straight on a frictionless surface. (#s in meters)



The time interval between successive positions is 1 s.

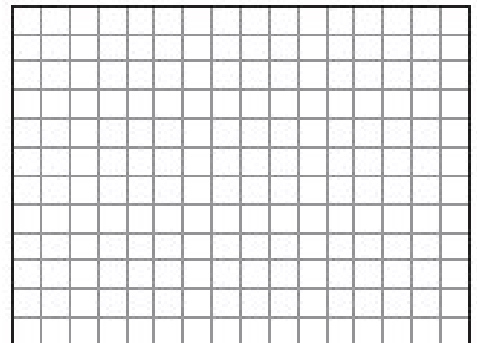
- What is the displacement of the ball after 3 s?
  - Where does the ball reach after 5 s?
  - After rolling for 7 s, the direction of motion of the ball is changed. It starts rolling toward its starting point. Assume the coordinate system and the speed of the ball to remain unchanged. What is the **displacement** of the ball between 7 s and 9 s?
2. A radio signal takes 1.28 s to travel from a transmitter on the Moon to the surface of Earth. The radio waves travel at  $3.00 \times 10^8$  m/s. What is the distance, in kilometers, from the Moon to Earth?
3. You and your friend start jogging around a  $2.00 \times 10^3$ -m running track at the same time. Your average running speed is 3.15 m/s, while your friend runs at 3.36 m/s. How long does your friend wait for you at the finish line?

4. You are making a map of some of your favorite locations in town. The streets run north–south and east west and the blocks are exactly 200 m long. As you map the locations, you walk three blocks north, four blocks east, one block north, one block west, and four blocks south.

Draw a diagram on graph paper to show your route.

What is the total distance that you traveled while making the map?

What is your final **displacement** from your starting point?



5. A car is moving with a uniform speed of 15.0 m/s along a straight path. What is the distance (in km) covered by the car in 12.0 minutes?
6. What is the distance traveled by a vehicle in 12 minutes, if its speed is 35 km/h?