

Average Speed Practice Problems

Problem solving Method

1. Draw A diagram of the problem (motion diagram, force diagram)
2. List what you are given and what you are trying to find.
3. Write the Equation that relates these quantities.
4. Do the math
5. Write your answer, with units.

1. What is the average speed of a dog that runs 500. m in 30. seconds?

$$\bar{S} = \frac{\text{Total Distance}}{\text{Total Time}} = \frac{500}{30} = \underline{16.7 \text{ m/s}}$$

2. In the 1988 Summer Olympics, Florence Griffith-Joyner won the 100 m race in 10.54 s. What was her average speed?

$$\bar{S} = \frac{\text{Total Dist.}}{\text{Total Time}} = \frac{100}{10.54} = \underline{9.49 \text{ m/s}}$$

3. On May 29, 1988, Rick Mears won the Indianapolis 500 in 3.45 hours. What was his average speed during the 500 mile race in mph?

$$\bar{S} = \frac{\Delta \text{distance}}{\Delta \text{Time}} = \frac{500}{3.45} = \underline{144.9 \text{ mph}}$$

4. The peregrine falcon is the world's fastest known bird and has been clocked diving downward toward its prey at a constant vertical speed of 97.2 m/s. If the falcon dives straight down from a height of 100.0 m, how much time does the rabbit below have to find a safe hiding place?

$$d = v \cdot t \quad \rightarrow \quad 100 = 97.2 \cdot t$$

$$d = 100 \text{ m}$$

$$t = ?$$

$$v = 97.2 \text{ m/s}$$

$$t = 100/97.2 = \underline{1.03 \text{ Sec}}$$

5. A jogger runs 200. m in 60 seconds then runs 1600. m in 600. seconds and finally sprints 200. m in 20 seconds. What is the jogger's average speed?

$$\bar{s} = \frac{\text{Total dist.}}{\text{Total Time}} = \frac{200 + 1600 + 200}{60 + 600 + 20}$$

$$\bar{s} = \frac{2000}{680} = 2.94 \text{ m/s}$$

6. A physics student drives a car at 40 km/hr for 2 hours and then 60 km/hr for another 2 hours. What was the average velocity of the physics student?

$$d = v \cdot t$$

$$80 = 40 \cdot 2$$

$$120 = 60 \cdot 2$$

$$\bar{v} = \frac{\text{Total dist}}{\text{Total Time}}$$

$$= \frac{80 + 120}{2 + 2} = \frac{200}{4} = 50 \text{ m/s}$$

7. A student drives a car 30 mi/hr for 35 minutes, 55 mi/hr for one hour and 45 mi/hr for 15 minutes (.25 hr.) During the trip, the student spent 20 minutes eating lunch and buying gas.

- a) How far did the student travel?

$$d = v \cdot t$$

$$17.5 = 30 \left(\frac{35}{60} \right)$$

$$55 = 55 (1)$$

$$11.25 = 45 \left(\frac{15}{60} \right)$$

$$d = 17.5 + 55 + 11.25$$

$$d = 83.75 \text{ miles}$$

- b) What is the average speed of the car for the trip?

$$\bar{s} = \frac{\text{dist}}{\text{Time}}$$

$$\text{Time} = 35 \text{ min} + 60 \text{ min} + 15 + 20$$

$$T = 130 \text{ min} = \frac{130}{60} = 2.167 \text{ hr}$$

$$s = \frac{83.75}{2.167} = 38.65 \text{ mph}$$