

Skills Worksheet

Math Skills**Velocity**

After you study each sample problem and solution, work out the practice problems on a separate sheet of paper. Write your answers in the spaces provided.

PROBLEM

Polar bears are extremely good swimmers and can travel as long as 10 hours without resting. If a polar bear is swimming at an average speed of 2.6 m/s, how far will it have traveled after 10.0 hours?

SOLUTION

Step 1: List the given and the unknown values.

Given: speed, $v = 2.6 \text{ m/s}$

time, $t = 10.0 \text{ h} \times 3,600 \text{ s/h} = 3.6 \times 10^4 \text{ s}$

Unknown: distance, $d = ? \text{ m}$

Step 2: Rearrange the speed equation to solve for distance.

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

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

$$d = vt$$

Step 3: Insert the known values into the equation, and solve.

$$d = \frac{2.6 \text{ m}}{\text{s}} \times (3.6 \times 10^4 \text{ s})$$

$$d = 9.4 \times 10^4 \text{ m} = 94 \text{ km}$$

PRACTICE

1. Suppose the polar bear was running on land instead of swimming. If the polar bear runs at a speed of about 8.3 m/s, how far will it travel in 10.0 hours?

2. Like the polar bear, the walrus is a strong swimmer, although it does not have the same endurance. For short periods of time, a walrus can swim at an average speed of 9.7 m/s. How far would a walrus swim at this speed in 3.4 minutes?

Math Skills *continued*

7. The Concorde is the fastest supersonic passenger jet. How long would the Concorde take to travel 6,265 km between New York City and London, assuming that the jet travels at its maximum speed of 2.150×10^3 km/h during the entire trip?
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8. The longest distance in a track-and-field event is the 10 km run. The record holder for the women's 10 km run is Wang Junxia of China. Assuming that she ran 10.00 km at an average speed of 5.644 m/s, what was her time?
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PROBLEM

Florence Griffith-Joyner set the women's world record for running the 200.0 m race in 1988. At the 1988 Summer Olympics in Seoul, South Korea, she completed the distance in 21.34 s. What was Griffith-Joyner's average speed?

SOLUTION

Step 1: List the given and the unknown values.

Given: distance, $d = 200.0$ m

time, $t = 21.34$ s

Unknown: speed, $v = ?$ m/s

Step 2: Write out the equation for speed.

$$\text{speed} = \frac{\text{distance}}{\text{time}} \quad v = \frac{d}{t}$$

Step 3: Insert the known values into the speed equation, and solve.

$$v = \frac{d}{t} = \frac{200.0 \text{ m}}{21.34 \text{ s}}$$

$$v = 9.372 \text{ m/s}$$

PRACTICE

9. The cheetah, the fastest of land animals, can run 274 m in 8.65 s at its top speed. What is the cheetah's top speed?
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10. In 1985, Matt Biondi set a record for the men's 100 m freestyle event in swimming. He took 49.17 s to swim the 50.0-m length of the pool and swim back. Assume that half of Biondi's record time was spent traveling the length of the pool. What was his speed?
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