

Motion Formulas

1. What is the formula to find average speed?
2. What are the two formulas to find average velocity?
3. When is the magnitude of an object's displacement equal to the distance that it traveled?
4. When is an object's average speed equal in size to its average velocity?
5. Write the name of the following variables and state the SI units for each:
 - a. Δx
 - b. a
 - c. Δt
 - d. v_f
 - e. v_i
6. How are units for acceleration different from units for velocity?
7. In a problem, how can you tell which is the final velocity and which is the initial velocity?
8. What does Δv represent? How does one calculate it?
9. What is the formula to find average acceleration?
10. Every second an object travels 3 m while traveling in a straight line.
 - a. What do we know about this object?
 - b. Sketch a graph of the object's position vs. time
 - c. Sketch a graph of the object's velocity vs. time
11. Every second an object travels 3 m/s faster than it did the previous second.
 - a. What do we know about this object?
 - b. Sketch a graph of the object's position vs. time
 - c. Sketch a graph of the object's velocity vs. time

Answers to Motion Problems

1) 16 m/s 2) 5 m/s 3) 1.5 m/s^2 4) 27 m/s 5) 5.1 m/s 6) 120 m

Motion Problems

State the given information, identify what you are looking for, write out the formula, and solve.

Problem #1	Problem #2	Problem #3
A boat starts from rest and accelerates at 0.8 m/s^2 for 20 seconds. What is its final velocity?	An ostrich runs 85 m in 17 seconds. What is the ostrich's average speed?	A motorcycle increases its velocity from 12 m/s to 27 m/s in 10 seconds. At what rate does it accelerate?
Given:	Given:	Given:
Unknown:	Unknown:	Unknown:
Formula:	Formula:	Formula:
Solve:	Solve:	Solve:

Problem #4	Problem #5	Problem #6
A car accelerates uniformly from 22 m/s to 32 m/s. Find the car's average velocity.	A sprinter starts from rest and accelerates at 1.6 m/s^2 for 8 m. Find the sprinter's final velocity.	A car accelerates at 2.4 m/s^2 for 10 s. Find its displacement if it starts from rest.
Given:	Given:	
Unknown:	Unknown:	
Formula:	Formula:	
Solve:	Solve:	