

## Average Rates of Change Problems

Name \_\_\_\_\_

Show all work leading to your answer. There will often be more than one way to solve the problem. You may use a calculator on \* problems.

1. Suppose that the velocity function of a particle moving along a coordinate line is

$$v(t) = 3t^3 + 2.$$

a) Find the average velocity over the time interval  $1 \leq t \leq 4$ .

b) Find the average acceleration over the time interval  $1 \leq t \leq 4$ .

2. Suppose that the acceleration function of a particle moving along a coordinate line is

$$a(t) = t + 1. \text{ Find the average acceleration of the particle over the time interval } 0 \leq t \leq 5.$$

\*3. During the first 40 seconds of a rocket flight, the rocket is propelled straight up so that

in  $t$  seconds it reaches of height of  $s(t) = \frac{t^3}{\sqrt{10}}$  feet.

a) What is the average height of the rocket during the first 40 seconds?

b) What is the average velocity of the rocket during the first 40 seconds?

c) What is the average acceleration of the rocket during the first 40 seconds?