

Chapter 3 Review Extra Practice

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1. For the following position versus time functions determine the functions for velocity and acceleration.

a. $s(t) = t(t - 5)^2$

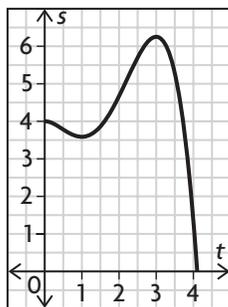
b. $s(t) = \frac{6}{(t - 4)^2}$

c. $s(t) = \sqrt{t^2 - 5}$

d. $s(t) = \frac{t^4}{16} + t^3 + t^{\frac{4}{5}}$

e. $s(t) = \frac{t^2}{\sqrt{t + 2}}$

2. For $0 \leq t \leq 4.1$ use the following position versus time graph for the motion of an object moving horizontally.



- When is the velocity zero?
- What is the maximum value on the given interval?
- What is the minimum value on the given interval?
- When is the object moving in the positive direction?
- When is the object moving in the negative direction?

3. Determine the absolute extreme values of each function of the given interval.

a. $f(x) = x^4 - 15x^3 + 50x, x \in [-1, 5]$

b. $f(x) = \frac{x^2 - 1}{x - 2}, 0 \leq x \leq 1$

c. $f(x) = 2x^2 + \frac{13}{x}, x \in [1, 4]$

- A man is building a fence around a portion of his backyard. He wants the area inside the fence to be 600 m^2 . If his house accounts for 20 m of the fence, what is the minimum amount of fencing he needs to purchase?
- At noon a car is driving west at 55 km/h . At the same time, 15 km due north another car is driving south at 85 km/h . At what time are the two cars closest, and what is the distance between them?
- A company is afraid they are spending too much on the production of some small cans they use. The current cans hold 80 ml . If the bottom of the can costs $\$0.002$ per cm^2 , the top costs $\$0.01$ per cm^2 and the side of the can costs $\$0.0009$ per cm^2 , how much is the cheapest can that holds the required amount?