

Name _____

7-5 Lesson Master

Questions on SPUR Objectives

See Student Edition pages 462–465 for objectives.

PROPERTIES

Objective C

1. If a continuous function has a local maximum at a given value of x , what must be true about the derivative of the function at that value of x ? _____
2. Use the fact that the derivative of the function g with $g(x) = -4x - x^5$ is given by $g'(x) = -4 - 5x^4$ to prove that g is decreasing over the set of all real numbers.

USES

Objective F

3. Jane and Vern are playing catch. When Jane throws the ball to Vern, the height h in feet of the ball after t seconds is given by $h = -16t^2 + 20t + 3$.
 - a. After how many seconds will the ball reach its maximum height? _____
 - b. What is the ball's maximum height? _____

4. Judy and her best friend Nancy are designing a cake for a bridal shower. In order to fit their design, the top of the cake must be square. They want to put special decorative piping around the top of the cake and down the side at each corner, as shown at the right. They have 60 inches of the decorative piping. Thus, if x is the length of the side of the cake, and y is the height of the cake, $4x + 4y = 60$.



- a. Given that Judy and Nancy want to frost the top and the four sides of the cake, write a formula for the frosted area A of the cake in terms of x and y . _____
- b. Use the fact that $4x + 4y = 60$ to write your answer to Part a in terms of x only. _____
- c. What should the dimensions of the cake be if Judy and Nancy want to maximize the frosted area of the cake? _____

REPRESENTATIONS

Objective I

In 5 and 6, use the graph of the first derivative function c' for the function c .

5.
 - a. For what values of x is $c'(x) > 0$? _____
 - b. What does this tell you about c ? _____
6.
 - a. Find a value of x such that $c'(x) = 0$. _____
 - b. What feature of c is located at this value of x ? How do you know?

