

Differentials and Marginal Analysis

1. Compare the values of dy and Δy for the function.
(similar to p.240 #1-6)

Function	X-Value	Differential of x
$f(x) = x^2 + x - 1$	$x = 1$	$\Delta x = dx = 0.01$

2. Let $x = 1$ and complete the table for the function

$dx = \Delta x$	dy	Δy	$\Delta y - dy$	$dy / \Delta y$
1.000				
0.500				
0.100				
0.01				
0.001				

$$f(x) = x^{-1/2}$$

3. Use differentials to approximate the change in cost, revenue, or profit corresponding to an increase in sales of one unit.

(Hint $dx = \Delta x = 1$)

(Similar to p.240 #13-18)

$$C = 0.01x^2 + 5x + 20 \quad x = 10$$

4. Use differentials to approximate the change in cost, revenue, or profit corresponding to an increase in sales of one unit.

(Hint $dx = \Delta x = 1$)

(Similar to p.240 #13-18)

$$R = 40x - 0.2x^2 \quad x = 25$$

5. Use differentials to approximate the change in cost, revenue, or profit corresponding to an increase in sales of one unit.

(Hint $dx = \Delta x = 1$)

(Similar to p.240 #13-18)

$$P = -x^2 + 40x - 30 \quad x = 10$$

6. Find the differential dy
(Similar to p.240 #19-28)

$$y = 9x^2 - 4x + 2$$

7. Find the differential dy
(Similar to p.240 #19-28)

$$y = \frac{x-3}{x+5}$$