

Calculus BC

Section 3.9 - Differentials

Obj: - To compare the value of the differential, dy , with the actual change in y , Δy .

1. Use differentials to approximate $\sqrt{25.4}$

Let $y = \sqrt{x}$

-differentiate using the differentials dy and dx

-substitute:

$$x = \quad dx =$$

-find dy

2. a) Given a circle with radius $r_0 = 8$. Find the change in area when r is increased by 0.01 .

This is ΔA

b) Given a circle with radius $r_0 = 8$. Estimate the change in area, dA , when r is increased by 0.01.

$$A = \pi r^2$$

- differentiate using dA and dr

- dr is the change in r
 dA is the change in area

3. The height of an object is given as $h(t) = 16t^2$. Estimate the change in height when there is an error of 0.1 sec in time at $t=5$ sec.

Change in height: $dh = ?$

Change in time: $dt = 0.1$ sec

$$h = 16t^2$$