

7. Suppose the cost of repaying a student loan at an interest rate of $r\%$ per year is $C = f(r)$ dollars.

8 pts

- (a) Briefly explain the meaning of dC/dr .

dC/dr is the rate of change of cost with respect to annual interest rate.

- (b) What are the units on dC/dr ?

$\$/\%$ per year ($= \$ \cdot \text{yr}$)

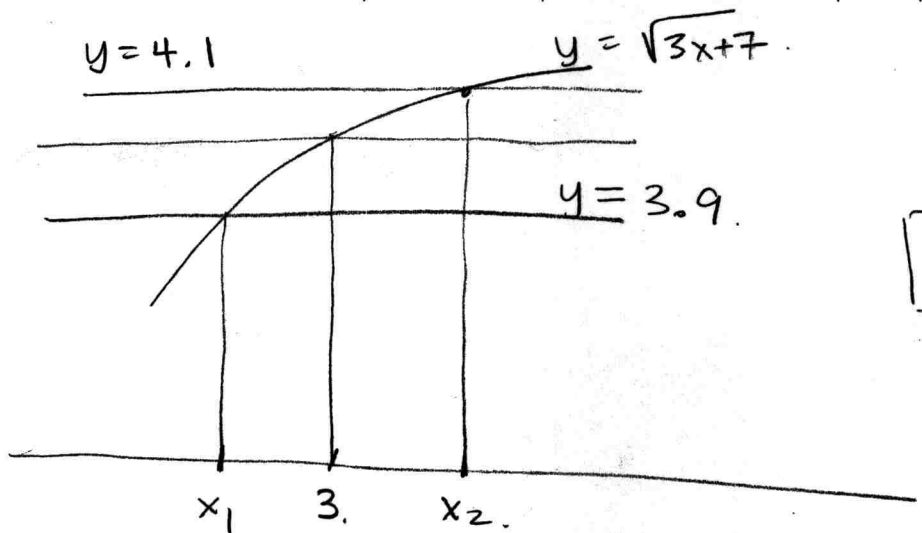
- (c) The quantity dC/dr (circle one) is positive is negative changes sign.

As interest rate increases, cost incr.

8. Find the largest possible value of δ so that

8 pts

$$|\sqrt{3x+7}-4| < 0.1 \text{ whenever } 0 < |x-3| < \delta.$$



$$\delta = \min(0.2633, 0.27)$$

$$\delta = 0.2633$$

$$\sqrt{3x+7} = 3.9$$

$$3x+7 = (3.9)^2$$

$$x_1 = \frac{(3.9)^2 - 7}{3}$$

$$\approx 2.7367$$

$$3 - x_1 \approx 0.2633$$

$$\sqrt{3x+7} = 4.1$$

$$x_2 = \frac{(4.1)^2 - 7}{3}$$

$$= 3.27$$

$$x_2 - 3 = 0.27$$

(OVER)