+4EC

Correct

[redacted]

Extra Credit #8

A rectangle's length is increasing at a rate of 8 cm/s and its width is increasing at a rate of 3 cm/s. When the length is 20 cm and the width is 10 cm, how fast is the areas of the rectangle increasing? Find a formula for how fast the area of the rectangle increases when the width of the rectangle is w and the length is l.

$a = lw$ (area = length(width) <= area of a rectangle

Product

$\frac{da}{dt} = \frac{dl}{dt}w + l\frac{dw}{dt}$ <= here we took the derivative of our "area of a rectangle"

Product Rule

with respect to time ($\frac{d}{dt}$)

now, we know "is increasing at a rate of" is fancy for derivative ✓ so we have all our numbers and can simply plug them in:

$\frac{da}{dt} = (8)(10) + (20)(3)$ (cm/s)(cm) + (cm)(cm/s)

$w=10$, $l=20$

$= 80 + 60$ cm^2/s <= simplify

derivative at a particular point in time.

$140\ cm^2/s$ <= solve and add your units

since you mentioned units!