

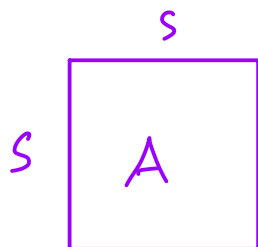
Name: _____

Quiz 7

Math 251

You have 20 minutes to complete this quiz. When you're finished, first check your work if there is time remaining, then turn it in. You may use your class notes (i.e. not the online notes), and a scientific calculator, but not a graphing one. You may not consult other people or the internet. **Show all your work.**

1. (8 points) A square is increasing in area at a rate of $4 \frac{m^2}{s}$. When its area is $100 m^2$, how fast is the side length increasing?



$$A = s^2$$



$$100 = s^2$$

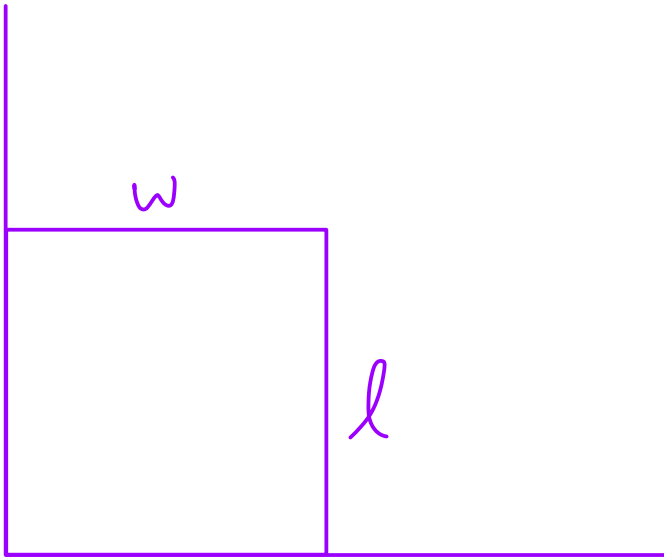
$$s = 10$$

$$\frac{dA}{dt} = 2s \frac{ds}{dt}$$

$$4 = 2 \cdot 10 \cdot \frac{ds}{dt}$$

$$\frac{ds}{dt} = \frac{4}{20} = \frac{1}{5}.$$

2. (8 points) You're building a garden against two walls forming a corner. You need the garden to be 100 square meters and want to minimize the amount of fencing material you use. What is the smallest total amount of fencing required?



$$100 = wl$$

$$P = w + l = w + \frac{100}{w}$$

$$\frac{dP}{dw} = 1 - \frac{100}{w^2} = 0$$

$$w^2 = 100$$

$$w = 10$$

$$\text{Min } P = 10 + \frac{100}{10} = \boxed{20}$$