1. $R = 1500x^2 - x^3$

$$\frac{dR}{dx} = 1500 \cdot 2x^1 - 3x^2$$

$$= 3000x - 3x^2$$

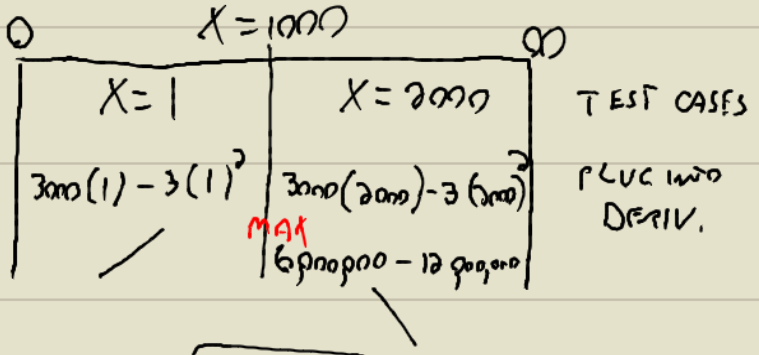
$$3000x - 3x^2 = 0$$

$$3x(1000 - x) = 0$$

$3x = 0$ $\quad$ $1000 - x = 0$

$\frac{3x}{3} = \frac{0}{3}$ $\quad$ $1000 = x$

~~$x = 0$~~



MAX AT $x = 1000$

$R = 1500(1000)^2 - (1000)^3$

$R = 500,000,000$

2. $C = 0.001x^3 + 2x + 16$

$$\bar{C} = \frac{0.001x^3}{x} + \frac{2x}{x} + \frac{16}{x}$$

$$\bar{C} = 0.001x^2 + 2 + 16x^{-1}$$

$$\frac{d\bar{C}}{dx} = 0.002x - 16x^{-2}$$

$$= \frac{0.002x}{1} - \frac{16}{x^2}$$

$$\frac{d\bar{C}}{dx} = \frac{0.002x^3}{x^2} - \frac{16}{x^2}$$

$$= \frac{0.002x^3 - 16}{x^2}$$

$0.002x^3 - 16 = 0$ $\quad$ $x^2 = 0$

$0.002x^3 = 16$ $\quad$ ~~$x = 0$~~

$\frac{0.002x^3}{0.002} = \frac{16}{.002}$

$x^3 = 8000$

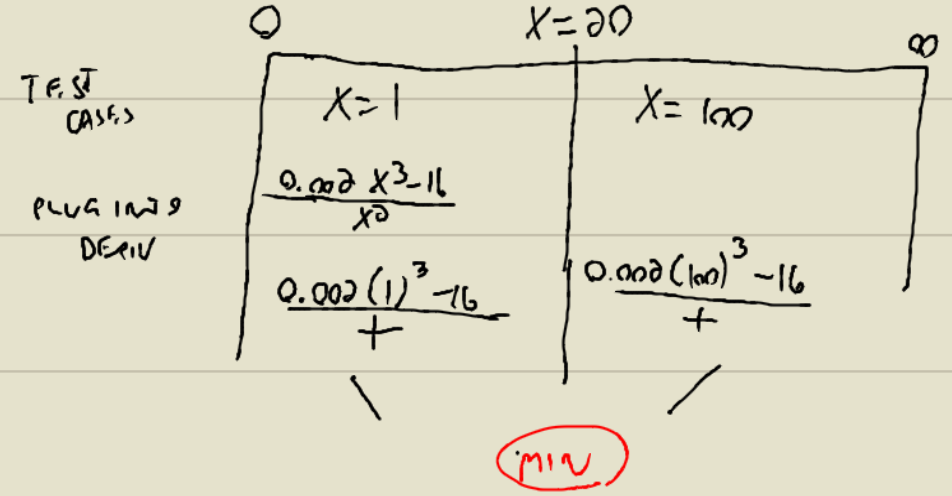
$x^{\frac{3}{1}} = 8000$

$(x^{\frac{3}{1}})^{\frac{1}{3}} = 8000^{\frac{1}{3}}$

$x = \sqrt[3]{8000}$

$x = \sqrt[3]{20 \cdot 20 \cdot 20}$

$x = 20$



MIN OCCURS AT $x = 20$