

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

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

$$= \underline{3000x - 3x^2}$$

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

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

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

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

$$\cancel{x=0}$$

X = 1000	
0	∞
X = 1	X = 2000
$3000(1) - 3(1)^2$	$3000(2000) - 3(2000)^2$
/	MAX $6000000 - 12000000$

TEST CASES  
PLUG INTO  
DERIV.

$$\text{MAX AT } X = 1000$$

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

$$R = 500,000,000$$

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

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

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

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

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

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

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

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

$$0.002x^3 = 16$$

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

$$x^3 = 8000$$

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

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

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

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

$$x = 20$$

X = 20	
0	∞
X = 1	X = 100
$\frac{0.002x^3 - 16}{x^2}$	$\frac{0.002(100)^3 - 16}{x^2}$
$\frac{0.002(1)^3 - 16}{x^2}$	+
/	+

TEST  
CASES

PLUG INTO  
DERIV

MIN OCCURS  
AT X = 20

MIN