

Solutions

Each answer shows the steps, then the **result**.

2.1

- $A'(y) = 40 - 4y$; $40 - 4y = 0 \Rightarrow y = 10$

2.2

- $A'(x) = 12 - 2x = 0 \Rightarrow x = 6$; $A''(x) = -2 < 0$, so $x = 6$ is a maximum

2.3

- $C'(x) = 2x - \frac{16}{x^2} = 0$; $2x^3 = 16 \Rightarrow x^3 = 8 \Rightarrow x = 2$

3.1 B

- \$f\$

(c)

- = 0withf"

(c)

- < 0\$ is a local maximum

3.2

(a)

- $A = 200x - x^2$, $A'(x) = 200 - 2x = 0 \Rightarrow x = 100$

(b)

- $A''(x) = -2 < 0$, so it is a maximum

(c)

- $A = 100(100) = 10\,000 \text{ m}^2$

3.3

(a)

- $V'(x) = 150 - \frac{3}{4}x^2$

(b)

- $150 - \frac{3}{4}x^2 = 0 \Rightarrow x^2 = 200 \Rightarrow x = \sqrt{200} \approx 14.1$; $V''(x) = -\frac{3}{2}x < 0$ for $x > 0$, so it is a maximum