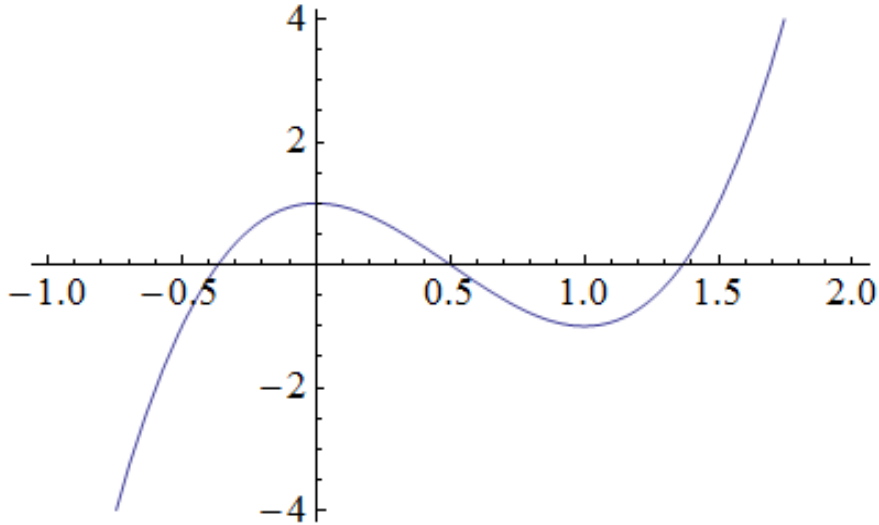


1. (i) critical numbers: $0, \frac{1}{2}, 1$
(ii) absolute maximum: $\frac{1}{16}$ absolute minimum: 0
2. (a) increasing: $(-\infty, 0]$ and $[1, \infty)$ decreasing: $[0, 1]$
(b) concave up: $[\frac{1}{2}, \infty)$ concave down: $(-\infty, \frac{1}{2}]$
inflection point at $(x, y) = (\frac{1}{2}, 0)$
(c)



3. minimum cost: \$270 (attained when the dimensions are $3\text{m} \times 6\text{m} \times \frac{10}{9}\text{m}$)
4. $s(t) = t^5 - \frac{5}{2}t^4 + \frac{5}{3}t^3 - \frac{1}{6}t$
5. (a) $\frac{28}{15}$
(b) 10
(c) 0
(d) $-\frac{1}{2}e^{-t^2} + C$
(e) $\ln(\ln s) + C$