

1. Find all absolute extrema for $f(x) = 2x^3 - 9x^2 + 12x$ on the interval $[0, 3]$.

2. A soup manufacturer wants to design a cylindrical tin can to hold a given volume V_0 of soup. If r and h are the respective radius and height of the can then:

i) The volume is given by $V_0 = \pi r^2 h$.

ii) The amount of tin required (i.e. the surface area of the can) is given by

$$S = 2\pi r^2 + 2\pi r h.$$

Find a relation between r and h so that the least amount of tin will be required.

3. Find all absolute extrema for $f(x) = x^3 - 6x^2$ on the interval $[-1, 6\frac{1}{8}]$.

4. (Off a previous Midterm) Using 30 feet of fence, you are to enclose an area along a wall. The area is to be in the shape of a right triangle. Find the maximum area that can be enclosed.