

1. Find the area of the surface obtained by rotating the following curve about the y -axis.

$$x = 3t - t^3, \quad y = 3t^2, \quad 0 \leq t \leq 1.$$

2. Find the points on the given curve where the tangent line is horizontal or vertical.

$$r = 1 - \sin \theta. \quad \text{Show these points on the graph.}$$