

Name: \_\_\_\_\_

Please show all work and box the answers, where appropriate.

1. (15 pts.) Evaluate

$$(a) \int \frac{(z^2 + 1)^2}{\sqrt{z^3}} dz \quad (b) \int \frac{(\sqrt{t} + 1)^8}{\sqrt{t}} dt \quad (c) \frac{d}{dx} \int_{\sqrt{x}}^1 \cos^8(t) dt$$

2. (10 pts.) Find the volume of the solid of revolution generated by rotating the region bounded by  $y - \sqrt{x} = 0$ ,  $x = 4$ ,  $y = 0$  around the  $y$  axis.
3. (10 pts.) Find the surface area generated by rotating the curve  $x = 3t, y = t^2 - 1$ ,  $0 \leq t \leq 1$  around the  $y$  axis.
4. (20 pts.) Find the centroid of the region between the curves  $y = 1 - x^2$  and  $y = x - 1$ . Sketch the region and the centroid.

1	2	3	4	total (55)	%