

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the surface area of the sphere with center $(0,0)$ and radius R by viewing this sphere as a solid of revolution of a parametric curve.

2. Give a general formula for the slope of the tangent line to the curve $r = \cos \theta + \sin \theta$, $0 \leq \theta \leq 2\pi$, at an arbitrary point θ .

3. Find the area of the shaded region, lying inside the curve $r = 3 \cos \theta$ and outside the curve $r = 1 + \cos \theta$.

