Name: ID #: Section #:

(**1**) [2*pts*] Find the center and radius of the sphere $3x^2 + 3y^2 + 3z^2 + 6y - 2z = 1$.

(**2**) Let C be the curve given by polar equation $r^2 = -\cos 2\theta$.

(**a**) [2*pts*] Identify symmetries of the curve C.

(**b**) [3*pts*] Sketch the curve C.

(**3**) [3*pts*] Find the area of the region shared by the circles $r = 2\sin\theta$ and $r = 1$.

Name: ID #: Section #:

(**1**) [2*pts*] Find the center and radius of the sphere $2x^2 + 2y^2 + 2z^2 - x + 4y = 1$.

(**2**) Let C be the curve given by polar equation $r^2 = -\sin 2\theta$.

(**a**) [2*pts*] Identify symmetries of the curve C.

(**b**) [3*pts*] Sketch the curve C.

(**3**) [3*pts*] Find the area of the region shared by the circles $r = 2\cos\theta$ and $r = 1$.