Name: ID #: Section #:

(**1**) [*2pts*] Describe in words the region of $\mathbb{R}^3$ represented by the following inequality or equations.

(**a**) $x^2 + y^2 + z^2 \geq 4x$

(**b**) $x = 2,\ z = -4.$

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

(**a**) [*3pts*] Graph the curve C.

(**b**) [*2pts*] Find the slope of the tangent line to C at $\theta = \pi/4$.

(**3**) [*3pts*] Find the area of the region that lies inside the curve $r = 2+\cos 2\theta$ and outside the circle $r = 2$.

Name: ID #: Section #:

(**1**) [*2pts*] Describe in words the region of $\mathbb{R}^3$ represented by the following inequality or equations.

(**a**) $x^2 + y^2 + z^2 \geq 2y$

(**b**) $y = 1,\ z = -3.$

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

(**a**) [*3pts*] Graph the curve C.

(**b**) [*2pts*] Find the slope of the tangent line to C at $\theta = \pi/4$.

(**3**) [*3pts*] Find the area of the region that lies inside the circle $r = 2$ and outside the curve $r = 2 - \cos 2\theta$.