



 Answers

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[E Click here for exercises.](#)[S Click here for solutions.](#)

1.  $x = x, y = y, z = -\sqrt{1 + x^2 + y^2},$   
 $-1 \leq x \leq 1, -3 \leq y \leq 3$
2.  $x = x, y = 6 - 3x^2 - 2z^2, z = z, 3x^2 + 2z^2 \leq 6$

 Solutions

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[E Click here for exercises.](#)[A Click here for answers.](#)

- Letting  $x$  and  $y$  be the parameters, parametric equations are  $x = x$ ,  $y = y$ ,  $z = -\sqrt{1 + x^2 + y^2}$  (since the surface lies below the rectangle) where  $-1 \leq x \leq 1$  and  $-3 \leq y \leq 3$ .  
*Alternate Solution:* Using cylindrical coordinates,  $x = r \cos \theta$ ,  $y = r \sin \theta$ ,  $z = -\sqrt{1 + r^2}$  where  $-1 \leq r \cos \theta \leq 1$  and  $-3 \leq r \sin \theta \leq 3$ .
- $x = x$ ,  $y = 6 - 3x^2 - 2z^2$ ,  $z = z$  where  $3x^2 + 2z^2 \leq 6$  since  $y \geq 0$ . Then the associated vector equation is  $\mathbf{r}(x, z) = x \mathbf{i} + (6 - 3x^2 - 2z^2) \mathbf{j} + z \mathbf{k}$ .