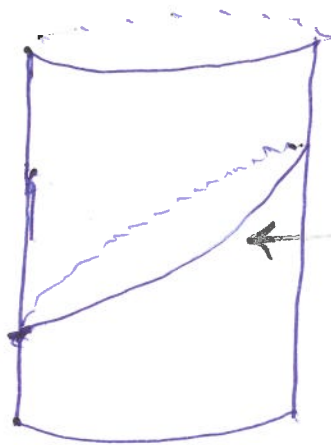**12.1, number 13: Give a geometric description of the set of points in 3-space which satisfy** $x^2 + y^2 = 4$ **and** $z = y$.

Answer: The set of points in 3-space which satisfy $x^2 + y^2 = 4$ is the cylinder of radius 2 which has the z axis in its center. The set of points in 3-space which satisfy $z = y$ is the plane which contains the the x-axis and makes a 45 degree angle with the xy-plane. The set of points which satisfy both equations is the intersection of the plane and the cylinder. This is an ellipse.

The answer is this ellipse.