Let c be the radius of the cylinder and s be the radius of the sphere, in inches. The volume remaining will be twice the volume above the xy-plane that lies inside the sphere but outside the cylinder:

```
V = FullSimplify[2 ∫_0^(2π) ∫_c^s (r Sqrt[s^2 - r^2]) dr dθ, {c ∈ Reals, s ∈ Reals, Abs[s^2/c^2] > 1}]
```

$$\frac{4}{3}\pi\left(-c^2+s^2\right)^{3/2}$$

Because the length of the cylinder is 6 inches, we can also create a right triangle with legs of length c inches and 3 inches and hypotenuse of length s inches. This allows us to make the following replacement:

```
V /. s → Sqrt[c^2 + 9]
```

$$36\pi$$

Therefore, the volume remaining is 36π cubic inches.