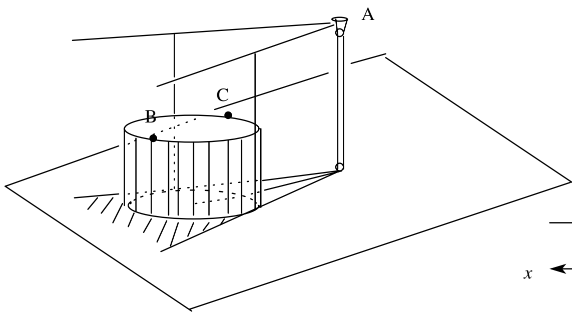
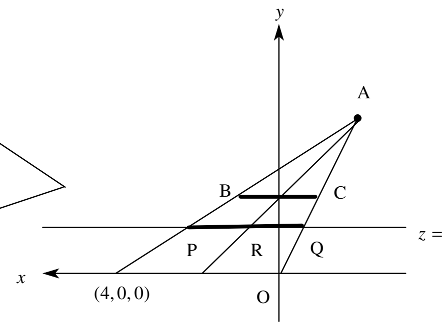
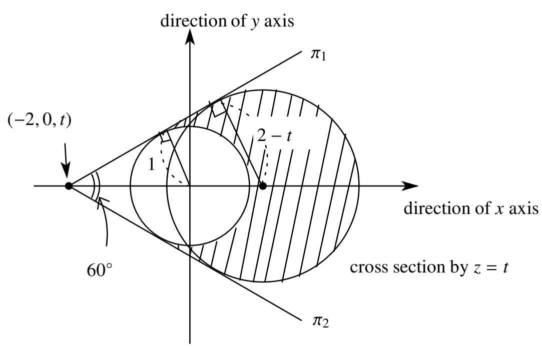
$\boxed{3}$





Take the origin at the center of the base of D, and set x, y axes on the ground such that the tip of the streetlight has cordinates $(-2, 0, 2)$. Take two points B and C, which have cordinates $(1, 0, 1)$ and $(-1, 0, 1)$ respectively. In addition, take two tangent planes to D through A named π_1, π_2. Then,π_1, π_2 devide the space into four parts, but only the part which includes D has no light.

Second, think about the cross section with the shadow produced by upper base of D ($x^2 + y^2 \leq 1, z = 1$) and a plane $z = t(0 \leq t \leq 1)$. It is inside the circle of radius 2-t ,with the center $R(2(t-1), 0, t)$ excluding D.



Therefore, the cross section with the shadow produced by D and the plane $z = t(0 \leq t \leq 1)$ becomes like the figure at left. Let the area of the cross section be $S(t)$, then

$$S(t) = \pi(2-t)^2 \times \frac{240^\circ}{360^\circ} + \{1 + (2-t)\} \times \sqrt{3}(1-t) - \pi \times 1^2 \times \frac{240^\circ}{360^\circ}\pi$$
$$= \frac{1}{3}(2t^2 - 8t + 6)\pi + \sqrt{3}(t^2 - 4t + 3)$$

Thus the volume of the shadow is;

$$V = \int_1^0 \left\{\frac{1}{3}(2t^2 - 8t + 6)\pi + \sqrt{3}(t^2 - 4t + 3)\right\} dt$$
$$= \frac{8}{9}\pi + \frac{4}{3}\sqrt{3} \qquad \cdots ans.$$