

Measurements/Geometry: Electrical Contractor

Power Plus, Inc.

Job Description: Run electrical jobs, including putting up lights and signal poles. Install lights in buildings.

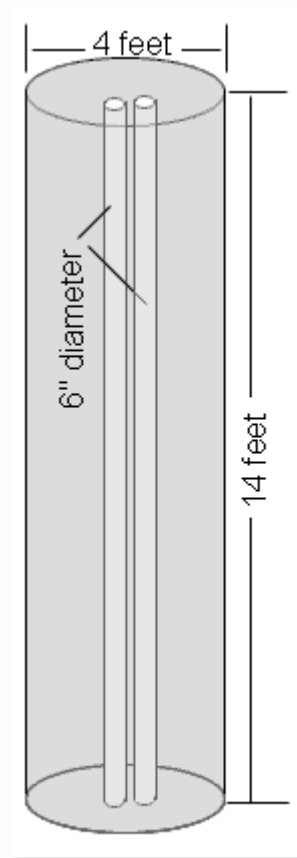
Problem:

An electrician has to pour a concrete signal base 4' in diameter, 14' deep with two 6" conduits coming up from the bottom and centered in the base.

How much concrete does he need to order?

Concrete is ordered by the cubic yard.

Solid lumber is sold by the board footage. A board foot is defined as a piece of lumber 1 inch thick by 12 inches wide by 12 inches long, or 144 cubic inches.



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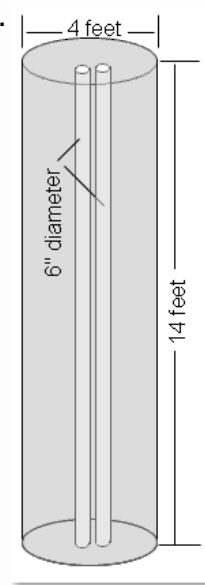
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Solution:

Subtract the area in cubic feet of the two conduits from the area in cubic feet of the base and translate to cubic yards.

diameter of base = 4 ft

diameter of each conduit = .5 ft

Formula for concrete needed = $\frac{(\text{area of base ft}^3) - 2 (\text{area of conduit ft}^3)}{\text{yd}^3}$

$$\frac{(\pi r^2 \cdot h) - 2 (\pi r^2 \cdot h)}{\text{yd}^3} = \frac{(3.14 \times 2^2 \times 14) - 2 (3.14 \times 0.25^2 \times 14)}{3 \text{ ft} \times 3 \text{ ft} \times 3 \text{ ft}}$$

$$= \frac{175.84 \text{ ft}^3 - 5.495 \text{ ft}^3}{27 \text{ ft}^3} = 6.3 \text{ cubic yards}$$