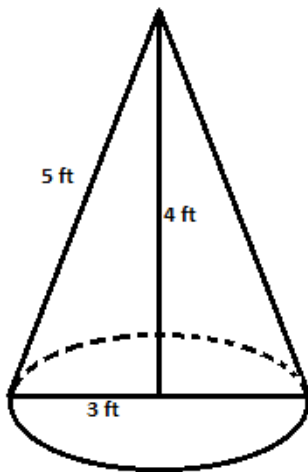


A party planner is designing a conical canvas tent for a child's birthday party. The tent has no floor, and it has a radius of 3 ft, a perpendicular height of 4 ft, and a slant height of 5 ft. If canvas sells by the square yard only, for \$23.00/yd², how much will the material cost?

Solution



We are given

$$r = 3 \text{ ft}$$

$$l = 5 \text{ ft}$$

$$h = 4 \text{ ft}$$

According to Wikipedia [http://en.wikipedia.org/wiki/Cone_\(geometry\)#Surface_Area](http://en.wikipedia.org/wiki/Cone_(geometry)#Surface_Area)

The lateral surface of a cone is:

$$SA = \pi r l$$

Calculating

$$SA = 3.14 * 3 * 5 = 47.1 \text{ ft}^2$$

So we need 47.1 ft² of material to make the conical tent without floor.

Converting ft² into yd²

$$1 \text{ yd} = 3 \text{ feet}$$

$$1 \text{ feet} = \frac{1}{3} \text{ yd}$$

$$1 \text{ ft}^2 = \frac{1}{9} \text{ yd}^2$$

Thus:

$$SA = 47.1 \text{ ft}^2 = \frac{47.1}{9} \text{ yd}^2 = 5.233 \text{ yd}^2$$

As canvas sells by the square yard only we should by **6 yd²** of it.

It will cost:

$$6 * 23 = \$138$$

Answer:

\$138