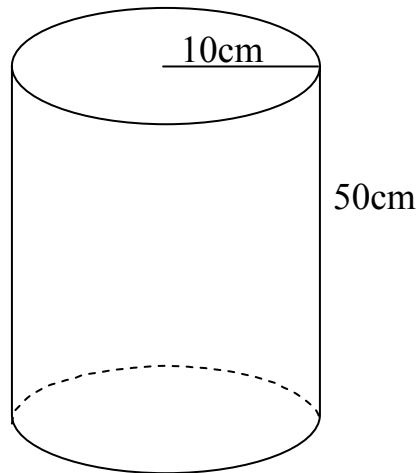


Sample Constructed Response Question from
*Preparing for the CSET – Multiple Subject
Mathematics*

Find the surface area of a cylinder with radius 10cm and height 50cm.
Use 3.14 as π .



Solution begins on next page

Solution

The surface area of a solid object is the area of its surfaces. That bit of circular reasoning doesn't help much, so let's think of the cylinder as a soup can and list all of its surfaces.

Take a can opener and remove the top and bottom from the can. We have 2 circles, each with a radius of 10.



The formula for the Area of a circle is $A = \pi \cdot r^2$

So the Area of **each** of these circles is $A = 3.14 \cdot (10)^2 = 3.14 \cdot 100 = 314 \text{ cm}^2$

Since there is a top and bottom to our can, the area of both circles is

$$\text{Area (both circles)} = 2 \cdot 314\text{cm}^2 = 628\text{cm}^2$$

Now for the side of the can, think about cutting off the label and unrolling it. We get a rectangle where the height is the height of the can and the base is the circumference of the circle (the distance around the lid).

The formula for the Circumference of a circle is $C = 2 \cdot \pi \cdot r$

For our lid it is $C = 2 \cdot 3.14 \cdot 10 = 62.8 \text{ cm}$

So now our rectangle can be labeled:

The formula for the Area of a rectangle is $A = b \cdot h$. For the label of our soup can, that is $A = 62.8 \cdot 50 = 3140 \text{ cm}^2$



So in total, the surface area is the area of the top and bottom circles plus the area of the rectangular label.

$$\text{SA} = 628 \text{ cm}^2 + 3140 \text{ cm}^2 = 3768\text{cm}^2$$

This sample problem and solution was our gift to you just for taking the time to visit the CSETMath website. If you like what you have seen, go back and select the "Order Now" link. *Preparing for the CSET Multiple Subject--Mathematics* workbook contains twenty-six multiple choice and two constructed response questions with solutions as detailed as this one.