ASSIGNMENT$_1$

AI21BTECH11021

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Question 3 (c)

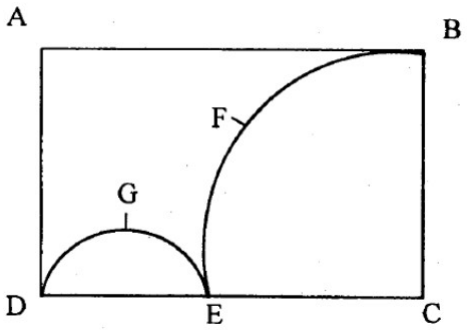

Figure 1: rectangle

In the figure given below, **ABCD** is a rectangle.**AB** = 14 cm**BC** = 7 cm. From the rectangle, a quarter circle **BFEC** and a semicircle **DGE** are removed. Calculate the area of the remaining piece of the rectangle.
(Take $\pi = 22/7$)

solution:

$$Areaofrectangle = length * width$$
$$Areaofcircle = \pi * radius^2$$

so area of rectangle $ABCD = 14cm * 7cm = 98cm^2$.

Area of BFEC region is $\frac{1}{4} * \pi * (7cm)^2 = \frac{77}{2}cm^2$ here radius is BC.

Area of GDE region is $\frac{1}{2} * \pi * (\frac{7}{2}cm)^2 = \frac{77}{4}cm^2$ the length of $BC = EC = 7cm$ also length of $AB = DC = 14cm$ so $DE = DC - EC = 7cm$

therefore
the radius of semicircle $GDE = \frac{DE}{2} = \frac{7}{2}cm$

Area of remaining piece of rectangle ADGEFBA = area of rectangle - area of semicircle - are of quarter circle.

$$\implies arearequired = 98cm^2 - \frac{77}{2}cm^2 - \frac{77}{4}cm^2 = \frac{161}{4}cm^2 = 40.25cm^2$$

$$\therefore Areaoftheregion \text{ ADGEFB} = 40.25\text{cm}^2$$

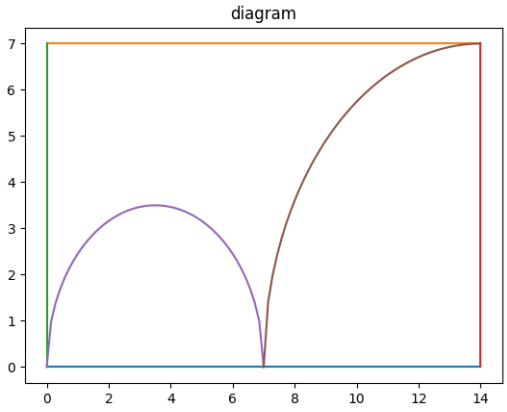

Figure 2: python programmed

Verifying the calculation in python gives

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area of the requires region = area of rectangle - area of semcircle-area of quatercircle
required area = 98-19.24225500323748-38.48451000647496 = 40.27323499028755
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Figure 3: python