

Answer on Question #80656 – Math – Geometry

Question

A rectangle is placed around a semicircle as shown below. The length of the rectangle is 4mm. Find the area of the shaded region.

Given:

The length of the rectangle: $a = 4\text{mm}$;

Solution

The area of the shaded area is equal to the difference between the areas of the rectangle and the semicircle inscribed in it:

$$S = S_{Rect} - S_{Semicircle}$$

semicircle area:

$$S_{Semicircle} = \frac{\pi d^2}{8}$$

length:

$$a = d;$$

width:

$$b = d/2;$$

Area of the rectangle:

$$S_{Rect} = ab;$$

$$S_{Rect} = \frac{d^2}{2}$$

$$S = \frac{d^2}{2} - \frac{\pi d^2}{8} = \frac{d^2}{8} (4 - \pi) = 1.72\text{mm}^2$$

Answer:

area of the shaded region: 1.72mm^2 .