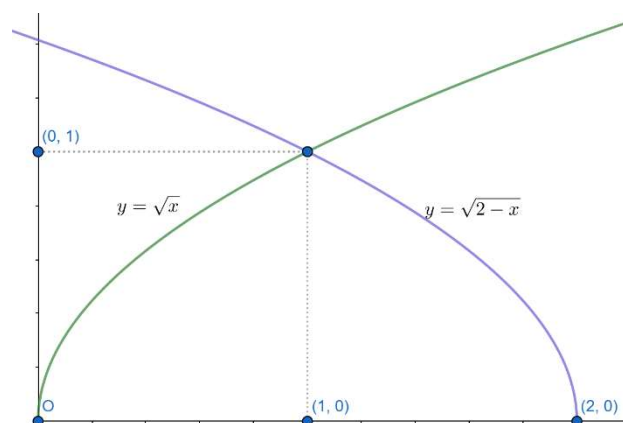


Question 1: **D** ✓

It is always worth drawing a sketch for this kind of question to ensure we know what area is being referred to. The sketch looks something like this:



and the required area is the “dome” defined by the two curves and the  $x$ -axis.

We can split the dome at  $x = 1$  and calculate the two areas separately.

The required area is thus:

$$\begin{aligned} & \int_0^1 \sqrt{x} \, dx + \int_1^2 \sqrt{2-x} \, dx \\ &= \left[ \frac{2}{3} x^{3/2} \right]_0^1 + \left[ -\frac{2}{3} (2-x)^{3/2} \right]_1^2 \\ &= \frac{4}{3} \end{aligned}$$

The correct answer is **D**.