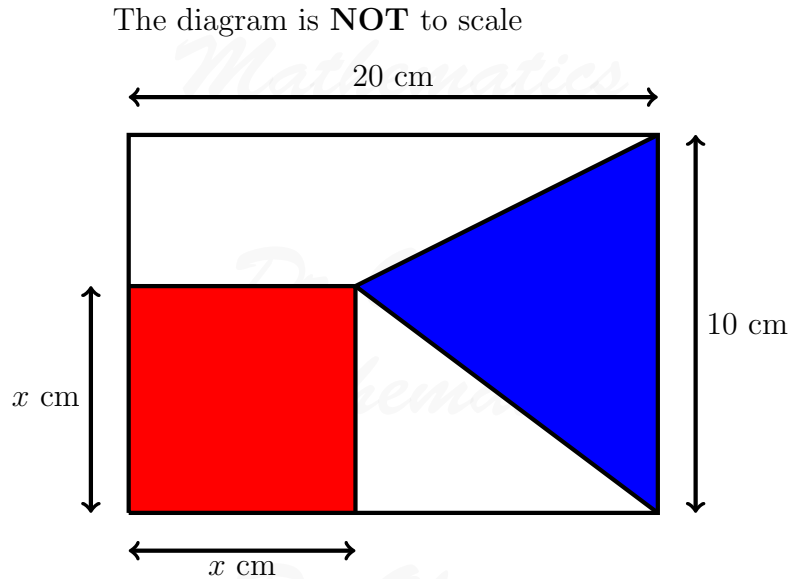


Dr Oliver Mathematics
Worked Examples
Length 5

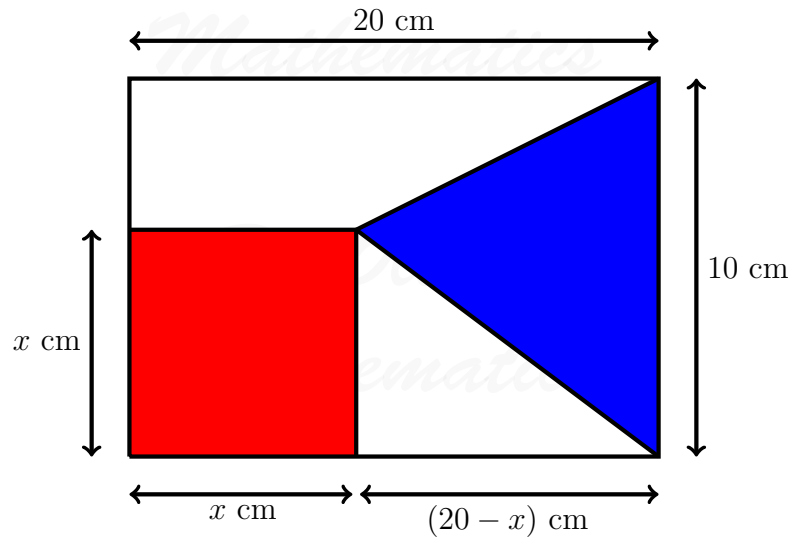
From: Nice Math, 8 March 2024

1. The red area is equal to the blue area



Find x .

Solution



Now,

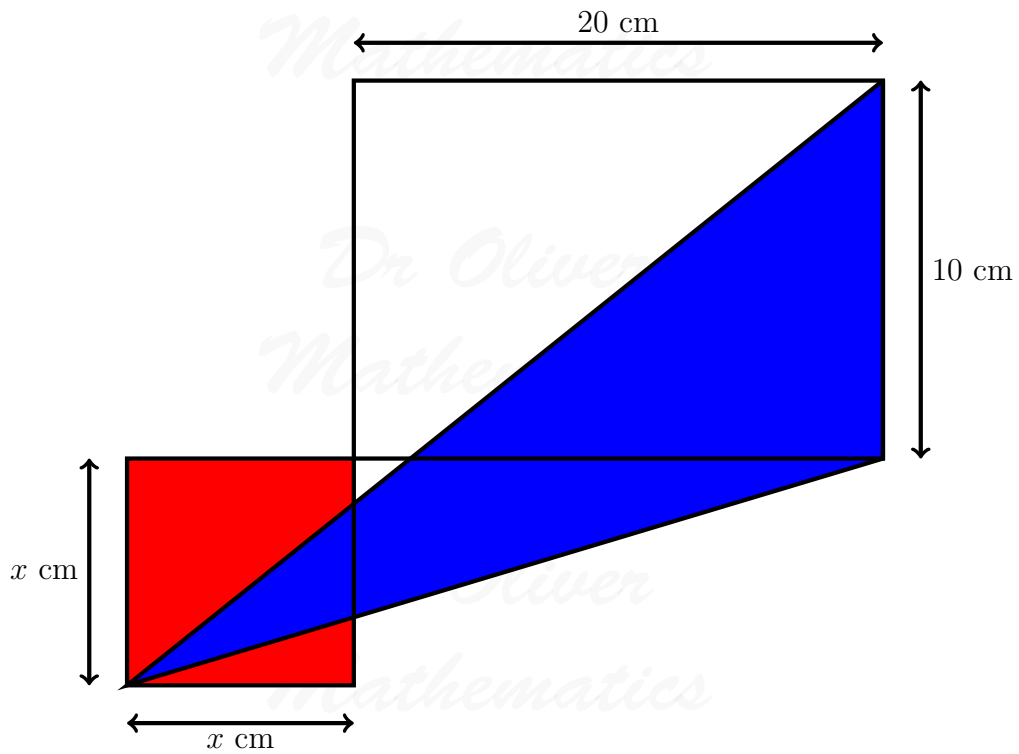
the red area is equal to the blue area

$$\begin{aligned}
 \Rightarrow x^2 &= \frac{1}{2}(10)(20 - x) \\
 \Rightarrow x^2 &= 5(20 - x) \\
 \Rightarrow x^2 &= 100 - 5x \\
 \Rightarrow x^2 + 5x &= 100 \\
 \Rightarrow x^2 + 5x + \left(\frac{5}{2}\right)^2 &= 100 + \left(\frac{5}{2}\right)^2 \\
 \Rightarrow \left(x + \frac{5}{2}\right)^2 &= 104\frac{1}{4} \\
 \Rightarrow x + \frac{5}{2} &= \pm \frac{5\sqrt{17}}{2} \\
 \Rightarrow x &= \frac{-5 \pm 5\sqrt{17}}{2} \\
 \Rightarrow x &= -12.80776406, 7.807764064 \text{ (FCD)}.
 \end{aligned}$$

Well, we want the positive solution (why?). Hence,

$$x = \underline{\underline{7.81 \text{ cm (3 sf)}}}.$$

Where does the negative solution come in? Well,



and you can check the the red and blue areas are **exactly** the same.