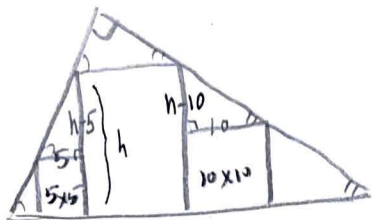


The Three-Box Problem

①



$$\frac{h-5}{10} = \frac{5}{h-10}$$

$$h^2 - 15h + 50 = 50$$

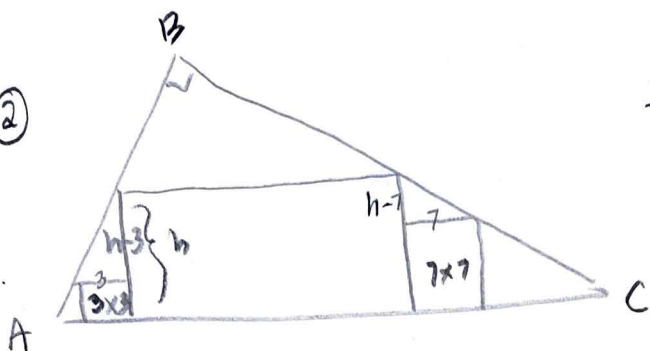
$$h^2 - 15h = 0$$

$$h(h-15) = 0$$

$$h = 0, 15$$

★

②



$$\frac{h-3}{7} = \frac{3}{h-7}$$

$$h^2 - 10h + 21 = 21$$

$$h(h-10) = 0$$

$$h = 0, 10$$

★

③

$$\frac{h-a}{b} = \frac{a}{h-b}$$

$$h^2 - ah - bh + ab = ab$$

$$h(h-a-b) = 0$$

$$h = a+b$$

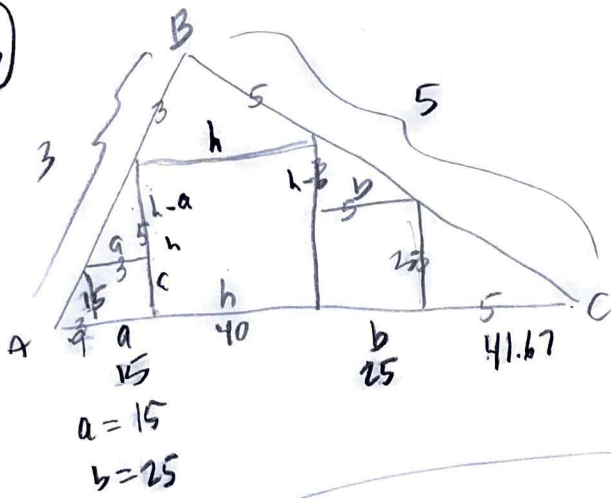
$$\text{④ } m \text{ of } \overline{AB} = \frac{h-a}{a} = \frac{a+b-a}{a} = \frac{b}{a}$$

$$m \text{ of } \overline{BC} = \frac{-(h-b)}{b} = \frac{-(a+b-b)}{b} = \frac{-a}{b}$$

$$\text{⑤ } h = a+b, \frac{b}{a} = \frac{5}{3} \text{ so } b = \frac{5a}{3}$$

$$\therefore h = \frac{3a}{3} + \frac{5a}{3} = \frac{8a}{3} = 40 \Rightarrow a = 15, b = 25$$

6



$$\frac{15}{x} = \frac{5}{3}$$

$$\frac{x}{25} = \frac{5}{3}$$

$AC = 130.67$ or $\frac{392}{3}$ units