

$$\sqrt{a} + \sqrt{b} = 17$$

$$a - b = 17$$

$$a = ?$$

$$b = ?$$



$$\sqrt{a} + \sqrt{b} = 17 \quad \text{and} \quad a - b = 17$$

----- Q U E S T I O N -----

$$\begin{array}{|l} \sqrt{a} + \sqrt{b} = 17 \\ a - b = 17 \end{array}$$

$$a = ?$$

$$b = ?$$

----- A N S W E R -----

----- (my solution) -----

$$\begin{array}{|l} \sqrt{a} + \sqrt{b} = 17 \\ a - b = 17 \end{array}$$

$$a - b = 17 \Rightarrow a = b + 17$$

if  $a = b + 17$  then  $\sqrt{a} + \sqrt{b} = 17$  becomes:

$$\sqrt{(b + 17)} + \sqrt{b} = 17$$

$$(\sqrt{(b + 17)} + \sqrt{b})^2 = 17^2$$

$$b + 17 + 2 \cdot \sqrt{(b + 17)} \cdot \sqrt{b} + b = 17^2$$

$$2b + 2 \cdot \sqrt{(b + 17)} \cdot \sqrt{b} = 17^2 - 17$$

$$2 \cdot \sqrt{(b + 17)} \cdot \sqrt{b} = 272 - 2b$$

$$(2 \cdot \sqrt{(b + 17)} \cdot \sqrt{b})^2 = (272 - 2b)^2$$

$$4 \cdot (b + 17) \cdot b = 272^2 - 1088b + 4b^2$$

$$4 \cdot (b^2 + 17b) = 272^2 - 1088b + 4b^2$$

$$4b^2 + 68b + 1088b - 4b^2 = 272^2$$

$$1156b = 272^2$$

$$b = 272^2 / 1156$$

$$\begin{array}{|l} \dots \\ b = 64 \\ \dots \end{array}$$

$$a - 64 = 17$$

$$a = 64 + 17$$

$$\begin{array}{|l} \dots \\ a = 81 \\ \dots \end{array}$$

----- (YT solution) -----

$$\begin{array}{|l} \sqrt{a} + \sqrt{b} = 17 \\ a - b = 17 \end{array}$$

$$a - b = 17 = (\sqrt{a})^2 - (\sqrt{b})^2 = 17$$

$$(\sqrt{a} + \sqrt{b})(\sqrt{a} - \sqrt{b}) = 17$$

$$17 \cdot (\sqrt{a} - \sqrt{b}) = 17$$

$$\sqrt{a} - \sqrt{b} = 1$$

$$\begin{array}{|l} L1: \sqrt{a} + \sqrt{b} = 17 \\ \dots \\ L2: \sqrt{a} - \sqrt{b} = 1 \end{array}$$

$$L1 + L2: \sqrt{a} + \sqrt{a} + \sqrt{b} - \sqrt{b} = 17 + 1$$

$$2\sqrt{a} = 18$$

$$\sqrt{a} = 9$$

$$\begin{array}{|l} \dots \\ a = 81 \\ \dots \end{array}$$

$$81 - 17 = b$$

$$\begin{array}{|l} \dots \\ b = 64 \\ \dots \end{array}$$