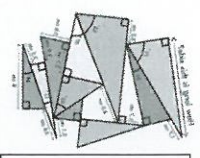
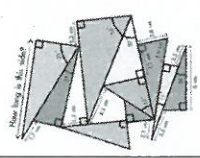
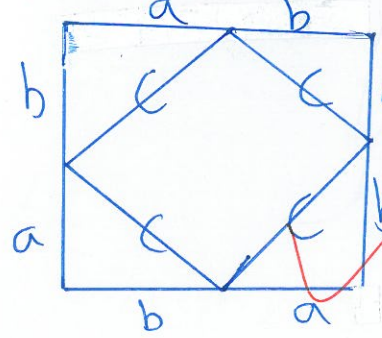


畢氏定理 承先啟後 學習單



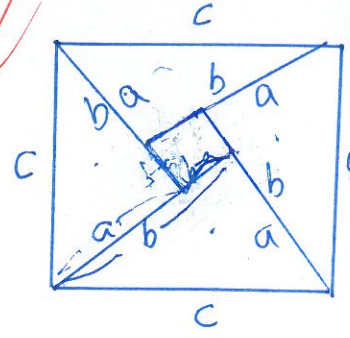
1. 面積組合繪圖與畢氏證明。



$$(a+b)^2 = c^2 + \frac{axb}{2} \times 4$$

$$a^2 + b^2 = c^2$$

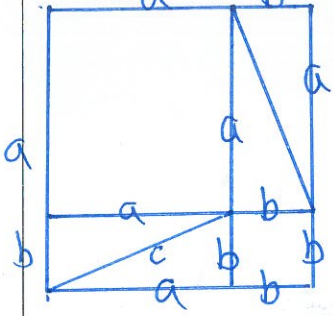
2. 面積組合繪圖與畢氏證明。



$$c^2 = \frac{atb}{2} \times 4 + (b-a)^2$$

$$c^2 = a^2 + b^2$$

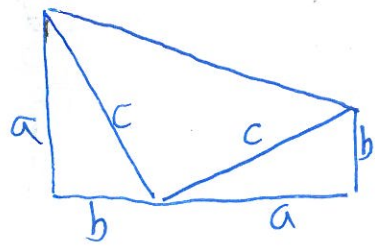
3. 面積組合繪圖與畢氏證明。



$$(a+b)^2 = a^2 + b^2 + \frac{axb}{2} \times 4$$

$$a^2 + 2ab + b^2 = a^2 + b^2 + 2ab$$

4. 面積組合繪圖與畢氏證明。



$$\frac{(a+b)^2}{2} = \frac{c^2}{2} + \frac{axb}{2} \times 2$$

$$\frac{a^2 + 2ab + b^2}{2} = \frac{c^2}{2} + ab$$

$$a^2 + 2ab + b^2 = c^2 + 2ab$$

$$a^2 + b^2 = c^2$$

5. 畢氏三元數總整理

a	b	c	a	b	c
3	4	5	11	60	61
5	12	13	12	36	37
7	24	25	18	63	65
8	15	17	20	21	29
9	40	41			
1	$\sqrt{3}$	2			
1	1	$\sqrt{2}$			

6. 非畢氏三元數例題試算，求 x、y。

$$x^2 = 6^2 + 10^2$$

$$= 36 + 100$$

$$= 136$$

$$x = \sqrt{136} = 2\sqrt{34}$$

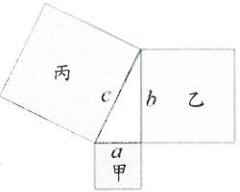
$$y^2 = 9^2 - 5^2$$

$$= 81 - 25$$

$$= 56$$

$$y = \sqrt{56} = 2\sqrt{14}$$

7. 右圖直角三角形三邊長 a、b、c，延伸正方形面積甲、乙、丙，假若甲為 10、乙為 80，則求 c=?

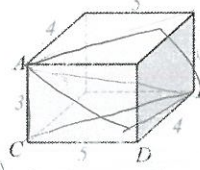


$$c^2 = (\sqrt{10})^2 + (\sqrt{80})^2$$

$$c^2 = 90$$

$$c = \sqrt{90} = \sqrt{3^2 \times 10} = 3\sqrt{10}$$

8.



- (1) 有一隻蜜蜂，想從箱子內部的A點飛到B點，求飛行的最短距離？
- (2) 有一隻螞蟻，想從箱子表面的A點爬到B點，求螞蟻爬行的最短距離？

(1) $\sqrt{4^2 + 5^2} = \sqrt{41}$ $AB = 3 + \sqrt{41} = 9 + \sqrt{41}$

(2) $AB = \sqrt{5^2 + 3^2} = \sqrt{34}$ $AB = \sqrt{50} = 5\sqrt{2}$