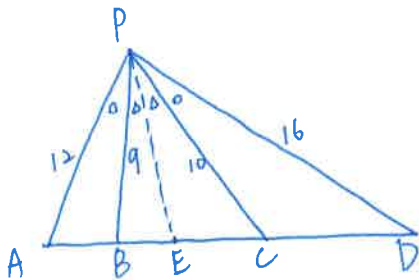


北一女中 103 學年度《數戰數決》有獎徵答活動

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題號：5-5 頁碼/總頁數：1 (如果只有一頁，可不填)

10 ★



作 $\angle APD$ 的角平分線與 AD 交點為 E

$$\because \angle APB = \angle CPD$$

\therefore 其 \sin 值相同

$$\Rightarrow \triangle APB : \triangle CPD$$

$$= \frac{1}{2} \times 12 \times 9 \times \sin \angle APB : \frac{1}{2} \times 10 \times 16 \times \sin \angle CPD$$

$$= 54 : 80$$

$$= 27 : 40$$

$\therefore \triangle APB, \triangle CPD$ 高相同

$$\therefore \overline{AB} : \overline{CD} = 27 : 40 \Rightarrow \text{設 } \overline{AB} = 27a, \overline{CD} = 40a$$

又 $\because \angle BPE = \angle EPC$

$$\therefore \overline{BE} : \overline{EC} = \overline{PB} : \overline{PC} = 9 : 10 \Rightarrow \text{設 } \overline{BE} = 9b, \overline{EC} = 10b$$

$\therefore \angle APE = \angle EPD$

$$\therefore \overline{AE} : \overline{ED} = \overline{PA} : \overline{PD} = 12 : 16 = 3 : 4$$

由此可得

$$\begin{aligned} \overline{AE} : \overline{ED} &= \overline{AB} + \overline{BE} : \overline{EC} + \overline{CD} \\ &= (27a + 9b) : (10b + 40a) = 3 : 4 \end{aligned}$$

$$30b + 120a = 108a + 36b$$

$$6b = 12a$$

$$\Rightarrow a : b = 1 : 2 \Rightarrow \text{設 } a = k, b = 2k \text{ 代回}$$

$$\overline{AB} = 27 \times k = 27k, \overline{BC} = 9b + 10b = 19 \times 2k = 38k, \overline{CD} = 40 \times k = 40k$$

$$\therefore \overline{AB} : \overline{BC} : \overline{CD} = 27 : 38 : 40$$

即為所求 *

$$A : 27 : 38 : 40$$