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$$16. (1). \cos A = \frac{b^2 + c^2 - a^2}{2bc} = \frac{\sqrt{5}}{2}$$

$$\frac{1}{2}c^2 = b^2 - a^2$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$\sin B - \sin^2 A = \pm \sin^2 C$$

$$\sin^2 A \cos^2 C + \pm \sin^2 A \cdot \pm \sin^2 C + \pm \sin^2 C \cdot \pm \sin^2 A + \sin^2 C \cos^2 A$$

$$-\sin^2 A = \pm \sin^2 C$$

$$\frac{1}{2} \cos^2 C + \frac{1}{2} \sin^2 C + \frac{1}{2} \cos^2 C - \frac{1}{2} = \pm \sin^2 C$$

$$\cos^2 C + \sin^2 C + \sin^2 C - 1 = \sin^2 C$$

$$\cos^2 C + 1 - 2\sin^2 C + \sin^2 C - 1 = \sin^2 C$$

$$\cos^2 C = 2\sin^2 C$$

$$\therefore \frac{\sin^2 C}{\cos^2 C} = \frac{1}{2} \quad \therefore \tan C = \pm \frac{1}{\sqrt{2}} \quad \therefore \tan C = \frac{\sqrt{2}}{2}$$

$$12) \sin C = \frac{\sqrt{6}}{3} \quad \cos C = \frac{\sqrt{3}}{3}$$

$$\sin B = \sin(A+C) = \sin A \cos C + \cos A \sin C$$

$$= \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{3} + \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{3} = \frac{2\sqrt{6}}{6}$$

$$S_{\triangle ABC} = \frac{1}{2} bc \sin A = 3$$

$$bc = 6\sqrt{2}$$

$$a^2 = b^2 + c^2 - 2bc \cos A$$

$$\therefore b = 2\sqrt{2}$$

AI Response:

### • † — 16. (1) :

...<sup>~</sup>™ \(\cos A\) š, > œ• ž Ÿ ĭ, Φ• < £ ž f•, ...œ• ¥| š,  
.. ©• ª « ¬ - " ®<sup>-</sup> ° Ē• ž

1. \*\*\(\sin^2B - \sin^2A = \frac{1}{2}\sin^2C\)\*\*

Φ † ±<sup>2 3</sup> ´ £ μ ¶, ^ %• † ± " ž

2. \*\*\(\cos^2C + 1 - 2\sin^2C + \sin^2C - 1 = \sin^2C\)\*\*

Φ † ± ¥| „<sup>1 °</sup> » , ¼½¾ ĵ Ā \(\cos^2C = 2\sin^2C\), · Ā Ā<sup>..</sup> \(\tan^2C = \frac{1}{2}\), Ā Ā \(\tan C = \frac{\sqrt{2}}{2}\) Φ † ± • < £ ž

### " Å Š <

\(\cos A = \frac{\sqrt{2}}{2}\) ĵ Æ \((A = 45^\circ)\) Ç \((A = 135^\circ)\) ž È ¶ É Ê Ë Ĺ, Í Î \((A = 45^\circ)\) Ā \((A = 135^\circ)\)  
İ Đ Ħ Ñ Ò Ó Ô ® Õ Ç ® Ö × É ž

Ø œ ž Ÿ ĭ \(\cos A = \frac{b^2 + c^2 - a^2}{2bc} = \frac{\sqrt{2}}{2}\) ž

Û Ü, > œ < Ÿ ĭ " ž Ÿ ĭ Û Ü• Ý ¥| ž ¼½¾, ...¥| \(\sin^2B - \sin^2A = \frac{1}{2}\sin^2C\) š, ĵ Þ• ...ß à > œ Ò Ó á â ã , f ± ä „<sup>1 °</sup> » ž å æ Û • Ç  
• > œ Ò Ó á â " Æ Ē Ĺ · Ý Å ž

### • è — 16. (2) :

é < £, f...ê œ † ± ¥| š, ĵ å è €• ž

1. \*\*\(\sin C = \frac{\sqrt{3}}{3}, \cos C = \frac{\sqrt{6}}{3}\)\*\*

Φ † ± • È ¶ • † — Ā<sup>..</sup> \(\tan C = \frac{\sqrt{2}}{2}\) ~™ Ā<sup>..</sup> , • < £ ž

2. \*\*\(\sin B = \sin(A + C) = \sin A \cos C + \cos A \sin C\)\*\*

Φ † ± Ø œ• " ĩ Í Î , ~™ ĩ • < £ ž

3. \*\*\(\Delta\_{ABC} = \frac{1}{2}bc \sin A = 3\)\*\*

Φ † ± • È ¶ Ò Ó Ô • Í Î Ā<sup>..</sup> , ~™ ð \((bc = 6\sqrt{2})\) • < £ ž

4. \*\*\((a^2 = b^2 + c^2 - 2bc \cos A)\)\*\* Φ † ± • ž Ÿ ĭ ñ œ, ¥| \((b = 2\sqrt{2})\) • < £ , f ^ %• ´ £ \((c)\) ò ž

### Ó ¾ Ô Õ

ö ÷<sup>-</sup> ° , f...ø ‡ ¥| ± ä ¾ „<sup>1 °</sup> » " ®<sup>-</sup> ° ž ù ú ...¥| š, û ü ø  
œ Å ý ´ • • Ç, þ ÿ † ± ã %•<sup>3</sup> ´ £ μ ¶ ž Ä , ...ê œ ~™ š, ^ %• ´ £ ô  
³ Æ ò, £ ð ž