1. 2

$\sin 25^\circ = \cos 65^\circ$ และ $\sin 45^\circ = \cos 45^\circ$

ดังนั้น $\sin 25^\circ + \sin 45^\circ = \cos 45^\circ + \cos 65^\circ$

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2. 4

$\sin 30^\circ = \frac{1}{2} = 0.5$, $\cos 45^\circ = \frac{\sqrt{2}}{2} = 0.7$, $\tan 45^\circ = 1$, $\sec 60^\circ = 2$,

$\csc 30^\circ = 2$, $\tan 60^\circ = \sqrt{3} = 1.732$, $\cos 60^\circ = \frac{1}{2} = 0.5$

ดังนั้น $\tan 60^\circ > \cos 60^\circ$

---

3. 3

$$6\tan^2 30^\circ - \frac{1}{4}\sec^2 45^\circ + \frac{5}{3}\sin^2 60^\circ = 6\left(\frac{1}{\sqrt{3}}\right)^2 - \frac{1}{4}\left(\sqrt{2}\right)^2 + \frac{5}{3}\left(\frac{\sqrt{3}}{2}\right)^2$$

$$= 6\left(\frac{1}{3}\right) - \frac{1}{4}(2) + \frac{5}{3}\left(\frac{3}{4}\right) = 2 - \frac{1}{2} + \frac{5}{4} = \frac{8-2+5}{4} = \frac{11}{4}$$

---

4. 2

$\hat{A}+\hat{B}=90^\circ$ และ $\hat{A}:\hat{B}:\hat{C}=1:2:3$ จะได้ $\hat{C}=90^\circ$, $\hat{A}=30^\circ$ และ $\hat{B}=60^\circ$

$$(\cos B+\sin A)^2 = (\cos 60^\circ+\sin 30^\circ)^2 = \left(\frac{1}{2}+\frac{1}{2}\right)^2 = 1$$

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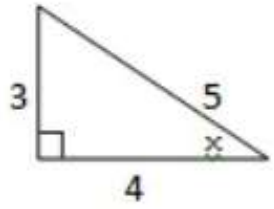
5. 3



$$3\cos x = 4\sin x$$

$$\frac{\sin x}{\cos x} = \frac{3}{4}$$

$$\tan x = \frac{3}{4}$$

$$\cos x = \frac{4}{5} \text{ และ } \sin x = \frac{3}{5}$$

$$\sec x+\csc x = \frac{5}{4}+\frac{5}{3} = \frac{15+20}{12} = \frac{35}{12}$$

---

6. 1

$$\sin 20^\circ = 0.342 = \frac{342}{1{,}000}$$

$$\sec 70^\circ + \csc 20^\circ = \csc 20^\circ + \csc 20^\circ = 2\csc 20^\circ = \frac{1000}{171}$$

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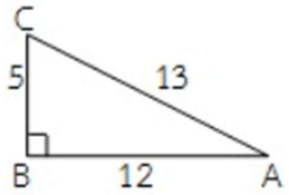
7. 1



$$65\sin A - 26\cos A = 65\left(\frac{5}{13}\right) - 26\left(\frac{12}{13}\right) = 25 - 24 = 1$$

---

8. 2

$$\cos^2 A - \sin^2 A = \frac{1}{2} \rightarrow \cos^2 A - (1 - \cos^2 A) = \frac{1}{2} \rightarrow 2\cos^2 A - 1 = \frac{1}{2}$$

$$\rightarrow \cos^2 A = \frac{3}{4} \rightarrow \cos A = \frac{\sqrt{3}}{2} \rightarrow A = 30^\circ$$

$$\sec A + \tan A = \sec 30^\circ + \tan 30^\circ = \frac{2}{\sqrt{3}} + \frac{1}{\sqrt{3}} = \frac{3}{\sqrt{3}} = \sqrt{3}$$

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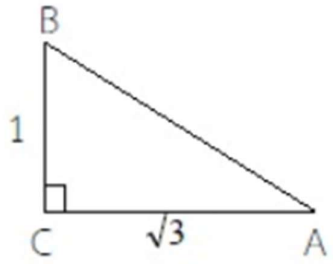
9. 4



พื้นที่ของรูปสามเหลี่ยม ABC $= \frac{1}{2} \times$ ความยาวของฐาน $\times$ ความสูง

$$\frac{\sqrt{3}}{2} = \frac{1}{2} \times CA \times CB$$

$$CA \times CB = \sqrt{3}$$

จะได้ $CA = \sqrt{3}$, $CB = 1$ และ $\hat{A} = 30^\circ$, $\hat{B} = 60^\circ$

ดังนั้น ข้อ 4 ไม่ถูกต้อง เพราะ $\tan B = \tan 60^\circ = \sqrt{3}$

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10. 3

$$B - A = \cos^2 45^\circ + \tan^2 60^\circ - \sin^2 60^\circ + \tan^2 30^\circ$$

$$= \left(\frac{\sqrt{2}}{2}\right)^2 + (\sqrt{3})^2 - \left(\frac{\sqrt{3}}{2}\right)^2 - \left(\frac{1}{\sqrt{3}}\right)^2 = \frac{1}{2} + 3 - \frac{3}{4} - \frac{1}{3}$$

$$= \frac{6 + 36 - 9 - 4}{12} = \frac{29}{12} = 2\frac{5}{12}$$

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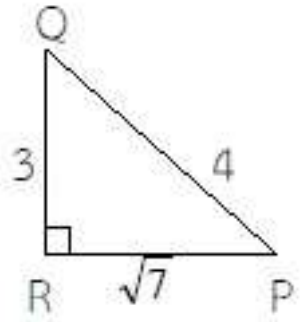
11. 2

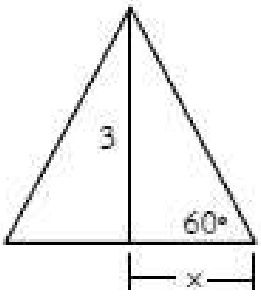


$\hat{P}+\hat{Q}=90^\circ$ และ $\sin P = 0.75 = \frac{3}{4}$

$$\frac{\sin Q+\cos P}{\tan Q} = \frac{\cos P+\cos P}{\tan Q} = \frac{2\cos P}{\tan Q} = 2\left(\frac{\sqrt{7}}{4}\right)\left(\frac{3}{\sqrt{7}}\right) = \frac{3}{2}$$

---

12. 1



$$\tan 60^\circ = \frac{3}{x} \rightarrow \sqrt{3} = \frac{3}{x} \rightarrow x = \sqrt{3}$$

พื้นที่ของรูปสามเหลี่ยม $= \frac{1}{2}\times 2(\sqrt{3})\times 3 = 3\sqrt{3}$ ตารางหน่วย

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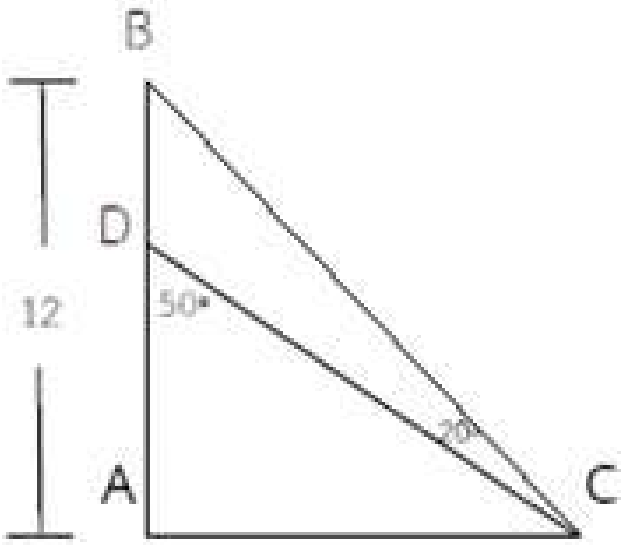
13. 3



$$\tan 30^\circ = \frac{AC}{12} \rightarrow \frac{1}{\sqrt{3}} = \frac{AC}{12} \rightarrow AC = 4\sqrt{3}$$

พื้นที่ของรูปสามเหลี่ยม $ABC = \frac{1}{2} \times 4\sqrt{3} \times 12 = 24\sqrt{3}$

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14. 3

จะได้ $CA = \sqrt{3}$, $CB = 1$ และ $\hat{A} = 30^\circ$, $\hat{B} = 60^\circ$

ดังนั้น $\cos A = \cos 30^\circ = \frac{\sqrt{3}}{2}$

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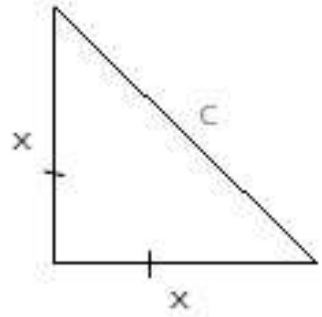
15. 1



จาก $C = \sqrt{2}x$

ความยาวรอบรูปสามเหลี่ยม $= 2x + \sqrt{2}x$

$2 - \sqrt{2} = x(2 + \sqrt{2})$

$$x = \frac{2-\sqrt{2}}{2+\sqrt{2}} = \frac{6-4\sqrt{2}}{2} = 3-2\sqrt{2}$$

ด้านที่ยาวที่สุดยาว $(3-2\sqrt{2})\sqrt{2} = 3\sqrt{2}-4$ หน่วย

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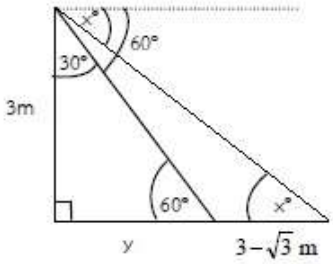
16. 2



$$\tan 30^\circ = \frac{y}{3} \rightarrow \frac{1}{\sqrt{3}} = \frac{y}{3}$$

$$y = \frac{3}{\sqrt{3}} \rightarrow y = \sqrt{3}$$

ดังนั้น ระยะทางจากเสาตั้งกล้องถึงระยะทางที่กล้องจับภาพได้ไกลสุดยาว 3 เมตร จะได้ $x = 45^\circ$