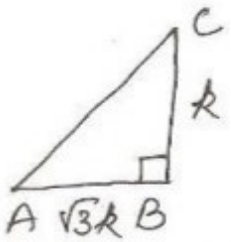
⑨ $\tan A = \frac{1}{\sqrt{3}}$ $\left(\frac{\text{O.S}}{\text{A.S}}\right)$



In rt $\triangle ABC$

$AC^2 = AB^2 + BC^2$ (Py. th.)

$= (\sqrt{3}k)^2 + k^2$

$= 3k^2 + k^2$

$= 4k^2$

$\Rightarrow AC = \sqrt{4k^2}$

$= 2k$

(i) $\sin A \cos C + \cos A \sin C$

$= \frac{k}{2k} \times \frac{k}{2k} + \frac{\sqrt{3}k}{2k} \times \frac{\sqrt{3}k}{2k}$

$= \frac{1}{4} + \frac{3}{4}$

$= \frac{4}{4}$

$= 1$

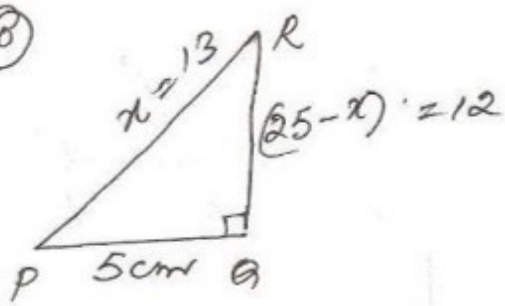
⑪ $\cos A \cos C - \sin A \sin C$

$= \frac{\sqrt{3}k}{2k} \times \frac{k}{2k} - \frac{k}{2k} \times \frac{\sqrt{3}k}{2k}$

$= \frac{\sqrt{3}}{4} - \frac{\sqrt{3}}{4}$

$= 0$

⑱



$PR + QR = 25$

let $PR = x$ cm

$QR = (25 - x)$ cm

In rt $\triangle PQR$

$PR^2 = PQ^2 + QR^2$ (Py. th.)

$x^2 = 5^2 + (25-x)^2$

$\Rightarrow x^2 = 25 + 625 + x^2 - 50x$

$\Rightarrow 50x = 650$

$\Rightarrow x = 13$

$\therefore PR = x = 13$ cm

$QR = 25 - 13$

$= 12$ cm

$\sin P = \frac{12}{13}$

$\cos P = \frac{5}{13}$

$\tan P = \frac{12}{5}$