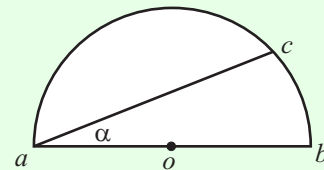


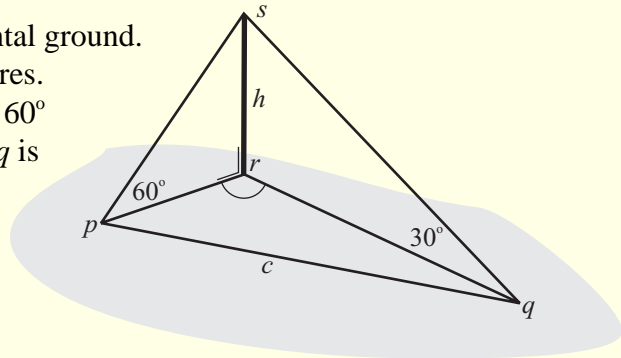
TRIGONOMETRY (Q 4 & 5, PAPER 2)

2007

- 4 (a) Show that $(\cos A + \sin A)^2 = 1 + \sin 2A$.
- (b) Find all the solutions of the equation
 $6\cos^2 x + \sin x - 5 = 0$, where $0^\circ \leq x \leq 360^\circ$.
Give the solutions correct to the nearest degree.
- (c) $[ab]$ is the diameter of a semicircle of centre o and radius-length r .
 $[ac]$ is a chord such that $|\angle cab| = \alpha$, where α is in radian measure.
- (i) Find $|ac|$ in terms of r and α .
- (ii) $[ac]$ bisects the area of the semicircular region.
Show that $2\alpha + \sin 2\alpha = \frac{\pi}{2}$.



- 5 (a) Evaluate $\lim_{x \rightarrow 0} \frac{\sin 2x}{\sin 3x}$.
- (b) Using the formula $\cos(A + B) = \cos A \cos B - \sin A \sin B$, derive a formula for $\cos(A - B)$ and hence prove that $\sin(A + B) = \sin A \cos B + \cos A \sin B$.
- (c) p, q and r are three points on horizontal ground.
 $[sr]$ is a vertical pole of height h metres.
The angle of elevation of s from p is 60°
and the angle of elevation of s from q is 30° .
 $|pq| = c$ metres.
Given that $13c^2 = 13h^2$, find $|\angle prq|$.



ANSWERS

- 4 (b) $30^\circ, 150^\circ, 199^\circ, 341^\circ$
(c) (i) $|ac| = 2r \cos \alpha$
- 5 (a) $\frac{2}{3}$
(c) 120°