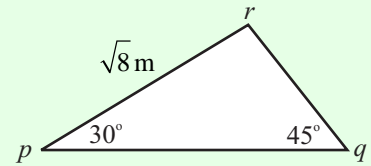


TRIGONOMETRY (Q 4 & 5, PAPER 2)

1996

- 4 (a) Show that the area of the triangle pqr , correct to one decimal place, is 2.7 m^2 , if $|pr| = \sqrt{8} \text{ m}$,
 $|\angle rpq| = 30^\circ$ and $|\angle pqr| = 45^\circ$.



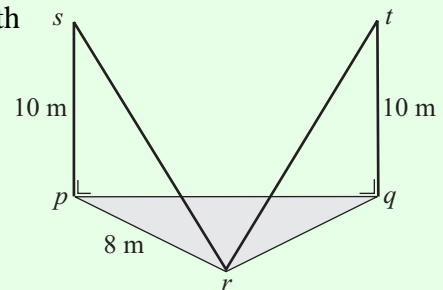
- (b) If $\tan(45^\circ - A) = \frac{1 - \tan A}{1 + \tan A}$ show that $\frac{\cos 2A}{1 + \sin 2A} = \tan(45^\circ - A)$.

Deduce that $\tan 22\frac{1}{2}^\circ = \frac{1}{\sqrt{2} + 1}$.

- (c) $[sp]$, $[tq]$ are vertical poles each of height 10 m , p , q , r are points on level ground. Two wires of equal length join s and t to r , i.e. $|sr| = |tr|$.

If $|pr| = 8 \text{ m}$, $|\angle pqr| = 32^\circ 12'$, $|\angle prq| = 120^\circ$, calculate

- (i) $|pq|$ to the nearest metre
 (ii) $|sr|$ in surd form
 (iii) $|\angle srt|$ to the nearest degree.



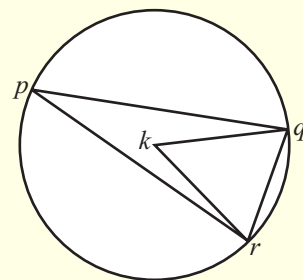
- 5 (a) Find the value k , if

$$k = \frac{\cos(\frac{\pi}{4} + \theta) - \cos(\frac{\pi}{4} - \theta)}{\sin(\frac{\pi}{4} + \theta) - \sin(\frac{\pi}{4} - \theta)} \text{ where } \sin \theta \neq 0.$$

- (b) p , q , r are points of a circle, centre k . The length of the radius of the circle is 2 cm .

The length of the minor arc pq is $\frac{5\pi}{3} \text{ cm}$.

- (i) Find the length of the chord $[pq]$, correct to two places of decimals.
 (ii) If $|pq| = |pr|$, find $|rq|$.



- (c) $x = 0^\circ$ and $x = 60^\circ$ are two solutions of the equation $a \sin^2 2x + \cos 2x - b = 0$ where $a, b \in \mathbf{N}$.

Find the value of a and the value of b .

Using these values of a and b , find all the solutions of the equation where

$$0^\circ \leq x \leq 360^\circ.$$

ANSWERS

4 (c) There was an error in this question.

5 (a) $k = -1$

(b) (i) 3.86 (ii) 2

(c) $a = 2, b = 1; 0^\circ, 60^\circ, 120^\circ, 180^\circ, 240^\circ, 300^\circ, 360^\circ$