

TRIGONOMETRY (Q 4 & 5, PAPER 2)

2008

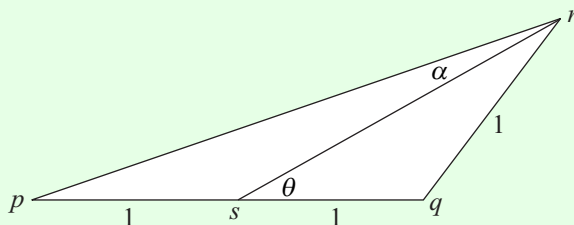
- 4 (a) A and B are acute angles such that $\tan A = \frac{5}{12}$ and $\tan B = \frac{3}{4}$.

Find $\cos(A - B)$ as a fraction.

(b) (i) Show that $\frac{\sin 2A}{1 + \cos 2A} = \tan A$.

(ii) Hence, or otherwise, prove that $\tan 22\frac{1}{2}^\circ = \sqrt{2} - 1$.

- (c) In the triangle pqr , $|\angle rsq| = \theta$, $|\angle prs| = \alpha$, $|rq| = 1$, $|ps| = 1$ and $|sq| = 1$.

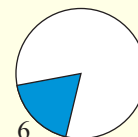


- (i) Find $|sr|$ in terms of θ .

- (ii) Hence, or otherwise, show that $\tan \theta = 3 \tan \alpha$.

- 5 (a) In the shaded sector in the diagram, the arc is 6 cm long, and the angle of the sector is 0.75 radians.

Find the area of the sector.



- (b) (i) Express $\sin 4x - \sin 2x$ as a product.

- (ii) Find all the solutions of the equation

$$\sin 4x - \sin 2x = 0$$

in the domain $0^\circ \leq x \leq 180^\circ$.

- (c) A triangle has sides of lengths a , b and c . The angle opposite the side of length a is A .

- (i) Prove that $a^2 = b^2 + c^2 - 2bc \cos A$.

- (ii) If a , b and c are consecutive whole numbers, show that

$$\cos A = \frac{a+5}{2a+4}$$

ANSWERS

4 (a) $\frac{63}{65}$

(c) (i) $|sr| = 2 \cos \theta$

5 (a) 24 cm^2

(b) (i) $2 \cos 3x \sin x$ (ii) $0^\circ, 30^\circ, 90^\circ, 150^\circ, 180^\circ$