

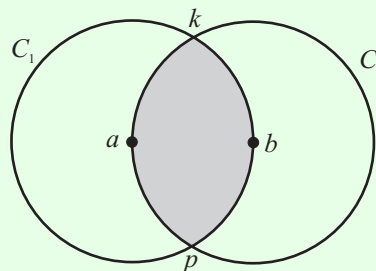
TRIGONOMETRY (Q 4 & 5, PAPER 2)

2003

4 (a) The circumference of a circle is 30π cm. The area of a sector of the circle is 75 cm². Find, in radians, the angle in this sector.

4 (b) Find all the solutions of the equation $\sin 2x + \sin x = 0$ in the domain $0^\circ \leq x \leq 360^\circ$.

4 (c) C_1 is a circle with centre a and radius r . C_2 is a circle with centre b and radius r . C_1 and C_2 intersect at k and p . $a \in C_2$. $b \in C_1$.



(i) Find, in radians, the measure of angle kap .

(ii) Calculate the area of the shaded region. Give your answer in terms of r and π .

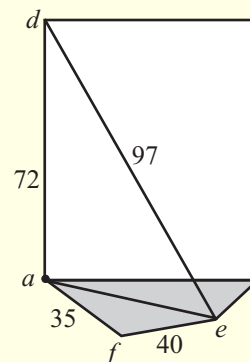
5 (a) Find the value of $\sin 15^\circ$ in surd form.

5 (b) a, f and e are points on horizontal ground. d is a point on a vertical wall directly above a .

$|ad| = 72$ m, $|de| = 97$ m, $|af| = 35$ m and $|fe| = 40$ m.

(i) Calculate $|ae|$.

(ii) Hence, calculate $|\angle afe|$.



5 (c) (i) Using the identity $\cos(A - B) = \cos A \cos B + \sin A \sin B$, or otherwise, prove:
 $\sin(A + B) = \sin A \cos B + \cos A \sin B$.

(ii) Prove: $\sin(A + B) \sin(A - B) = (\sin A + \sin B)(\sin A - \sin B)$.

ANSWERS

4 (a) $\frac{2}{3}$ rad

4 (b) $0^\circ, 120^\circ, 180^\circ, 240^\circ, 360^\circ$

4 (c) (i) $\frac{2\pi}{3}$ (ii) $2r^2(\frac{\pi}{3} - \frac{\sqrt{3}}{4})$

5 (a) $\frac{\sqrt{3}-1}{2\sqrt{2}}$

5 (b) (i) 65 m (ii) 120°