

1. (a) Without using tables find the value of:

(i) $\sin^2 60^\circ + \sin^2 30^\circ$ (3)

(ii) $\sec^2 A - 1$ when $A = \frac{\pi}{3}$ rad. (4)

(iii) $\sin A$ when $\tan A = \frac{2}{3}$ & $180^\circ < A < 270^\circ$ (5)

(b) Use tables to find:

(i) $\cos 593^\circ$ (3)

(ii) $\tan 2.7516$ rad (5)

(c) Solve for x : (giving all values of x between 0° & 360°)

(i) $\sin x = \frac{1}{2}$ (2)

(ii) $\tan x = \frac{2}{3}$ (4)

(d) Prove (i) $\frac{1}{\sec A + \tan A} = \frac{\cos A}{1 + \sin A}$ (6)

(ii) $\operatorname{cosec}^4 A - 1 = \cot^2 A (\cot^2 A + 2)$ (5)

(Marks = 37)

2. The angle of depression of the top of a house viewed from the top of a tower 60ft high is 35° , while from the base of the tower the angle of elevation of the same point is 47°

Find (i) the height of the house

(ii) the distance between the house and tower.

(Marks = 9+8)

3. (a) Define: (i) Orthocentre (ii) Circumcentre
(iii) In centre (iv) Centroid of a triangle

(Marks = 1+1+1+1)

(b) Given the base and vertical angle of a triangle, what is the locus of the centre of the inscribed circle?

(Marks = 8)

(c) If P is the point of intersection of the perpendiculars drawn from the vertices of an acute-angled triangle ABC to the opposite sides prove that the angle BPC is equal to the sum of the angles ABC & ACB .

(Marks = 8)

4. (a) The speed of a train is reduced from 40ft/sec to 10ft/sec in a distance of 150 yards. If the retardation is uniform, find how much faster it will travel before coming to rest.

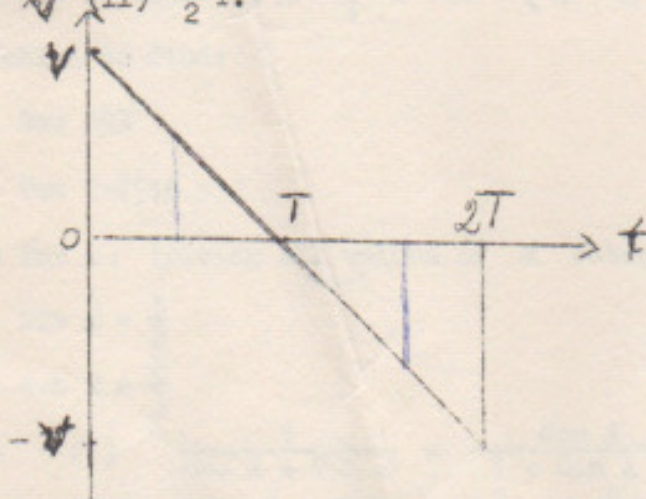
Further

(Marks = 8)

4. (b) The motion of a particle along a horizontal line is represented by the straight line $v - t$ graph shown. Describe the motion.

Calculate the distance of the particle from its initial position after time:

- (i) $\frac{1}{2}T$ (ii) $\frac{3}{2}T$.



(Marks = 8)

- (c) A Stone falls from rest. Find

- (i) The distance it will fall in 4 seconds.
(ii) The time it takes to fall 100 feet.

(Marks = 8)