



QUESTION WORKBOOK

Radians, arcs and small angles

Trigonometry · Year 12–13

7 questions · 20 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Convert 60° to radians and $3\pi/4$ radians to degrees, exactly. [2]

A2 A sector has radius 5 cm and angle 0.8 radians. Find its arc length and area. [2]

SECTION B · Standard

B1 A sector has radius 9 cm and angle 1.4 radians. Find its perimeter and its area. [3]

B2 An arc of length 12 cm subtends an angle θ at the centre of a circle of radius 7.5 cm. Find θ , and the area of the sector. [3]

- B3** Find the area of the minor segment cut off by a chord in a circle of radius 6 cm, where the chord subtends 1.2 radians at the centre. Give 3 significant figures.

[3]

SECTION C · Stretch

- C1** Using the small-angle approximations, find the approximate value of $(1 - \cos 2\theta)/(\theta \sin \theta)$ when θ is small and in radians.

[4]

- C2** The approximation $\sin \theta \approx \theta$ is stated for θ in radians. Show it performs well at $\theta = 0.1$ radians, and explain why the same statement fails completely if θ is measured in degrees.

[3]