# Radians, circular functions and periodic models

## Learn and practise | Free preview

A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the worked example, then show each step in the practice questions. Show the mathematical steps. A calculator, graphing tool or CAS may be used to check results where useful.

## What you will practise

• Circular functions, exact values and periodic models

Useful starting skills: Year 10 algebra, factorisation, functions, indices, geometry and elementary probability.

Radians measure angle using arc length divided by radius: $\theta = s/r$. A full turn is $2\pi$ radians.

For $A\sin(nx)+c$ or $A\cos(nx)+c$, amplitude is $|A|$ and period $2\pi/|n|$. Tangent has period $\pi/|n|$ and no amplitude. Use domain and phase to interpret models.

## Worked example

For $y = 3\sin(2t)+5$, state amplitude, period and midline.

Read $|A| = 3$, $n = 2$, $c = 5$

period $2\pi/2$.

Answer: 3, $\pi$, $y = 5$.

## Try it yourself

Name: _____ Date: _____

1. Convert 150° to radians.

2. A radius 4 m subtends angle π/3. Find arc length.

## Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. $5\pi/6$.

Multiply 150 by $\pi/180$.

2. $4\pi/3$ m.

$s=r\theta$.

Curriculum reference: Mathematical Methods Units 1–2 — Circular functions, exact values and periodic models

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